Riot Medicine

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Disclaimer

This will provide an overview of the knowledge needed to provide basic medical care during protests and civil unrest using incomplete and improvised equipment. This book is not a substitute for professional medical training, so you are **strongly encouraged** to supplement the knowledge from this book with outside resources.

Additionally, the legality of protest, practice of medicine, and their intersections varies from region to region, so there will be no attempt to make absolute statements about what is legal or illegal. Statements about the law are meant to guide you in the right direction, however they are not qualified legal advice. It is up to you to research the political and legal climate where you will be operating and make your own decisions.

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This book is dedicated to
all the medics
all over the world
who have risked life and limb
to care for those injured
in the struggle for liberation.

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Introduction

> I can also tell in whose hands I am. Do these hands tremble? There can be no doubt: these are the hands of a military officer. Is it a firm pulse? I say without vacillating: these are the hands of a liberator.
>
> Ricardo Flores Magón, *The Rifle*[1]

Riot medicine is the practice of medicine in an adversarial environment. It exists outside of formal and State sanctioned medical services. Practitioners of riot medicine go by many names (riot medics, street medics, demonstration medics, action medical), but at the end of the day, their goals are the same. They take to the streets as part of the diverse system of mutual aid that allows individuals to engage in protest. The duties of a riot medic may include handing out water during a peaceful demonstration, providing late-night jail support for arrested comrades, caring for injured protesters and bystanders during a riot, or extracting and providing lifesaving interventions for combatants during an armed uprising.

The lens of riot medicine rather than street medicine was chosen to help you focus more on how to provide medical care during demonstrations and physical engagements rather than to inform you on how to run a volunteer clinic or provide care for injuries sustained outside of short lived confrontations.[i] The aim is to provide enough medical and tactical knowledge to enable riot medics to support short mobilizations on the scale of several hours to several days.

If you are an experienced medical professional, this book will guide you on how to safely operate during a protest. However, this book assumes that medicine may not be your primary occupation or field of study. Both the common and more formal medical terms are included as well as a glossary for reference. Foundational medical theory has been provided to give context for various treatments, and as such, not all information in this book needs to be memorized. Some information may seem obvious, but what is obvious to you is not obvious to others. In depth information is provided to help demystify seemingly esoteric practices and address common misconceptions.

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[i] Riot medics are strongly encouraged to apply their medical knowledge by providing aid in other contexts such as caring for houseless persons and providing disaster relief.

Because of the exceptionally diverse conditions under which riot medicine is practiced, this book generally avoids making absolute statements about how an individual or group must act. Riot medics may be part of the Black Bloc or may act as seemingly neutral third parties. They may be uncertified or may be practicing physicians. How they choose to act depends on many factors including the nature of the action, the legality of protest, the legality of practicing medicine, and the overall political climate of the region where an action is taking place. This book will provide you with a toolbox that will help you make operational decisions using your own experiences and context specific information.

Riot medicine incorporates elements of wilderness medicine and combat medicine, but it is still a distinct practice. Often the riot medic is only equipped with what they can carry in a backpack. What they choose to pack is limited by multiple factors, the major one being that their gear can be confiscated or destroyed during the course of their work. They need to carry provisions to survive the day and personal protective equipment to keep themselves safe enough to do their job. The riot medic needs to take a highly practical approach to medicine knowing that they will not be able to operate under ideal conditions. Hospital-quality diagnostic equipment will not be available, materials may be limited, and care rendered often will only be “good enough” to get a restless comrade back into the fray.

Riot medics comfort traumatized comrades as much as they heal their bodies. Protests and confrontations with fascists and the State can be stressful and even traumatizing. Even in the nonideal environments you will be working in, it is your responsibility to keep calm and help calm those around you. Nervous and stressed out comrades can be liable to make mistakes that lead to more injuries. Reading this book will help enable you to act confidently and therefore help others act confidently, contributing toward successful demonstrations and insurrections.

This book is written from an autonomous, anarchist perspective. However, the information and tactics described within will be useful to all participants in the struggle for liberation. State imposed laws and regulations are a reality, and where it is relevant, it is noted where your work may intersect with the legal system to highlight what legal risks there may be. This book was written in 2019–20, so as you are reading this, be wary that medical best practices, legal considerations, and all other information may have become out of date.

The act of challenging the State is dangerous, but with some basic knowledge, medics can drastically reduce the repercussions protesters face. The goal is that by reading this book, you will be able to provide care for and support to comrades known and unknown, all in the pursuit of a world free of domination.

Part I

Organize!

1 : Responsibilities

> Most of my heroes are ordinary. / Their shapes, forms, and sizes, they may vary. / And some are just like you, and some are like me. / Some of my heroes are ordinary.
>
> Shireen Crisis Folk, *Heroes*[2]

Medics make up the autonomous part of the healthcare system that attends actions and interfaces with the organizations and individuals involved in protest and civil unrest. Even during the least confrontational actions, participants may need medical assistance. Hot weather can make people ill, and fascists may make surprise attacks against participants. As the level of violence increases, police repression can make it increasingly risky for protesters to use traditional Emergency Medical Services (EMS),[i] so social movements must provide their own medical care.

While rare, life-threatening injuries require immediate attention, and survival rates drop with each additional minute before aid arrives. Medics who are on scene can administer lifesaving interventions until the patient can be brought to advanced medical care. In some cases, advanced medical care may be delayed by large crowds, road blocks, or malicious police obstruction; or it may not be available at all.

The term "propaganda of the deed" is often assumed to refer to violence alone, but it means so much more. By helping each other, we encourage others to do the same. In a 2007 essay, the Aftershock Action Alliance described such direct challenges to the State as "insurrectionary mutual aid."[4]

> It is through acting and learning to act that we will open a path to insurrection…
>
> The force of an insurrection is not the state's military response, but the social upheaval it generates. Beyond the surface of the

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[i] During the 2019–20 Hong Kong protests, injured protesters were afraid of being arrested at hospitals.[3] At times, police road blocks prevented patients from getting to hospitals at all. Medics set up two hotlines, one for physical trauma and one for emotional trauma, to help medical professionals to provide aid to protesters.

> armed clash, the importance of any particular revolt should be evaluated by how it managed to expand the paralysis of normality in a given area and beyond.

In this sense, caring for one another demonstrates the fallibility of existing institutions and that we are capable of providing what the State cannot or will not. Our actions provide the means for reshaping and replacing the existing order.

Tasks

Medics' responsibilities do not begin and end with an action. There is preparation and coordination that needs to be done with organizers and participants beforehand. Ongoing care and jail support may need to happen after actions.

Your responsibilities during actions are something you are likely already familiar with. They may include:[5]

- Providing care to injured individuals
- Spreading calm when others may panic
- Evacuating injured persons to safety
- Interfacing with traditional EMS
- Setting up makeshift clinics to care for multiple casualties
- Instructing patients on aftercare
- Providing emotional and psychological support for patients experiencing trauma

Outside of actions, you will need to work to prepare yourself and others for medical emergencies that may occur in the future. Some of these topics will be covered more in depth as you read this book.

Educate yourself. Reading this book and practicing medicine in the field is not enough to be a proficient medic. You should supplement the knowledge in this book through courses (formal or informal) with experienced educators.

Study tactics. Study the tactics and practices of other street medics and stand upon the shoulders of giants. Study the behavior and tactics of police and fascists in your region. Prepare yourself for the confrontations you may encounter.

Train. Train your body and mind with other medics. Work out together. Run drills together. Become adept in all areas of riot medicine.

Coordinate with others. Learn to work with other organizations in your region. There may be legal observers, anti-repression support, and other organizations that provide mutual aid during actions. Legal support may document injuries to file official police brutality complaints. Medics can catalogue injuries and turn anonymized documentation over to legal teams as part of lawsuits against the police.

Learn the local languages. There may be one primary language in your region, but not everyone may be able to speak it well. Minorities, immigrants, and refugees have more reason to protest and are more likely to targeted by police brutality or fascist aggression. Learning the basics of other common languages will make it easier to calm and treat patients.

Educate others. It is your responsibility to educate the next generation of medics. As you learn, teach others. Teach non-medic activists the basics of first aid and treatment for riot control agents so they can care for themselves. A movement or collective that is open and shares will inspire others to join it. By educating others, you will help prevent injuries and minimize lasting damage when medics aren't present.

Provide post-arrest jail support. Arrested comrades may be injured while being arrested. They may have psychological trauma from police abuse. Be ready to pick them up after they've been arrested. All you need is a medic bag, some food, water, and clean clothes for them to change into.

Limitations

There are some limitations all medics must adhere to while operating in a medic capacity.

Offer free service. Medics must not charge for their services. They must not solicit donations while in service.[ii] These solicitations may be interpreted as mandatory "donations" that must be given up in order to receive care. The very act of charging for services removes the solidarity from the care provided and turns mutual aid into a transaction. Charging for service creates a hierarchy among patients where only those who can pay may receive care.

Maintain patient-caregiver confidentiality. Medics must not break patient confidentiality. Apart from the ethical concerns of violating the trust between a medical practitioner and their patient, this may be illegal and violate local healthcare regulations. Medics do not talk to the police or journalists about their patients. Medics do not share photos or blog about patients they treat because given the number of cameras present during actions, it is unlikely this can be done while maintaining patient anonymity.[iii]

[ii] Passive solicitation by clipping a can to the outside of your bag is, of course, entirely reasonable.

Obtain informed consent. Medics must get informed consent from a patient before touching them or beginning care. When a patient consents to care, they are only consenting to the care necessary to heal them or provide lifesaving interventions. They are not consenting to a full medical examination or the collecting of tissue samples. Patients cannot consent to procedures like this because, as someone who is in need of care or in a possibly altered mental state, their consent is not freely given. Asking to take samples is likely coercion.[iv] Additional details about consent during an examination can be found in Chapter 6 ("Patient Assessment").

Stay within your scope of practice. Medics must not provide care outside their scope of practice. A medic must not use equipment they do not know how to use safely or correctly, and they do not administer treatments they are not qualified to give. Additionally, there may be laws that forbid use of certain equipment, medications, or procedures without certification.

Do not abandon patients. Medics must not abandon a patient once they have begun care. Generally, this means continuing care until treatment is completed, a more qualified provider takes over, the patient's illness is outside the medic's scope of knowledge, or the scene becomes unsafe. Further details can be found in Chapter 6 ("Patient Assessment").

[iii] Exceptions to this are when things are done with consent of the patient or when it is sufficiently anonymized. Documenting police brutality can be useful propaganda when done well, but it should not come at the expense of the patient's anonymity or safety. The general rule is do not publish photos or details of care rendered for the sake of notoriety or proof of importance.

[iv] During Yellow Vest actions in France in 2019, there were reports on April 20th and May 1st that street medics were taking blood samples.[6] These medics claimed to be doctors who wanted to analyze blood samples for hydrogen cyanide from expired CS gas. Consent was given, but not freely, while injured persons were treated on the streets. Photos taken of these events show medics wearing respirators and patients attempting to cover their faces because they were still in danger. The medics chose to treat the patients as lab rats to satisfy their own curiosity instead of getting the patients to safety.

Risk and Self-Preservation

Confronting the State and fascism is an inherently risky endeavor, and there is some amount of risk you need to accept by joining a social movement. You should make preparations in case you are hospitalized or arrested. This is covered further in Chapter 3 (“Pre-Action Planning”).

When treating a patient for any serious injury, you should not stop unless law enforcement makes you stop. By becoming a medic and offering treatment, this is a risk you accept. Obeying police and halting treatment can kill people.[v] If police want you to stop, make them drag you away from your patient.[vi]

Generally, you should know what laws you are willing to break in the course of your work. This may mean simply remaining with a protest that is declared an unlawful assembly, or it may mean working closely with insurrectionaries during fighting in the streets. You should figure out what actions you are or are not willing to take or what laws you are willing to break before you are confronted with the decision. This allows you to have a sense of risk beforehand so you don’t make irrational snap decisions you may later regret.

More common than medics who are excessively risky are medics who are unwilling to take any meaningful risk in the course of their work. There are people who don a medic’s uniform only as a means of getting closer to conflict, using the uniform as a shield against arrest or police brutality. Sometimes these people are capable of performing basic first aid, and other times they are not. They may genuinely believe themselves to be medics, but often they are incapable of providing aid and leave patients behind.[viii] These people are riot tourists.[ix] They participate in mass actions so they can get close to the action to say “I was there,” and regale their friends with stories of their bravery while facing far less risk than the other protesters.[x] Don’t become a medic for the safety. Don’t

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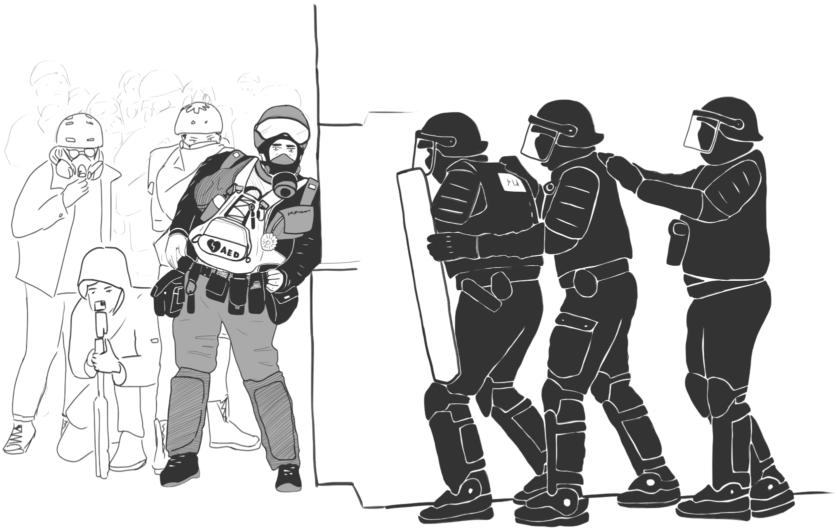
[v] During Unite the Right in Charlottesville, Virginia on August 12th, 2017, neo-nazi James Alex Fields Jr. drove a car into antifascist protesters injuring, among others, Heather Heyer. Street medics assisted Heyer and performed CPR when she went into cardiac arrest. A State Trooper forcibly removed an EMT from assisting, threatened others who lined up to help, and attempted to stop a street medic (a nurse) from performing CPR.[7,8] Heyer died as a result of her injuries.

[vi] This shouldn’t be taken as literal in all circumstances. If a patient has a small scrape, it might not be worth it to get arrested. Conversely, a grievously injured patient may need to be abandoned if police show up and the consequence of getting arrested is getting disappeared. Protect your patient, but also use your own judgement.

[vii] On January 11th, 2019, this photo[10] was taken in Paris showing medics and journalists hiding around the corner from riot cops.

Figure 1.1: French Medics Hiding from Cops[9,vii]



become a medic for the stories you can tell. Become a medic to help others.

Just as much as your have a responsibility to not shy away from risk, you have a responsibility to your own self-preservation. If you get injured at an action, not only can you not help others, but precious resources must be diverted towards helping you. You may become so injured that you cannot help at any action for months. Likewise, if you are arrested, you cannot help anyone.

Activists, including riot medics, may develop unhealthy complexes that push them into engaging in unnecessarily risky behavior. Some people develop martyr complexes where they feel they aren't really contributing toward a cause unless they are suffering. This may come

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[viii] In 2018, at the start of the Yellow Vest movement, there was an increase in the number of street medics and street medic groups. Many of these groups were inexperienced and lacked the medical knowledge necessary to render care. Local medics suspected that in part this influx was due to the relative safety medics had compared to other protesters.

[ix] Not to be confused with the same term referring to individuals who travel to have the opportunity to participate in mass actions, though in some cases they may overlap.

[x] Not unlike some so-called "journalists."

from external drivers like the need to “prove” to others that they are truly dedicated to a cause or the need to demonstrate credibility by getting injured or arrested. The best way to demonstrate your dedication to a cause is by repeatedly showing up to actions and efficiently rendering care.

Summary

As a medic, you should be calm, knowledgeable, and willing to take whatever steps are necessary to provide care. You should practice mutual aid and encourage it in others. Medicine is a specialty skill, and you should teach others so that they can help with the burden of supporting other actions and treating the injured.

2 : Organizational Structures

> We live in capitalism, its power seems inescapable – but then, so did the divine right of kings. Any human power can be resisted and changed by human beings.
>
> Ursula K. Le Guin[11]

Medics are an important part of the broader infrastructure that enables effective political action and civil unrest. Medics, along with legal support, organizers, material donors, and others, allow individuals to engage in actions without having to be experts in every domain or procure every resource on their own. Comrades can risk arrest knowing that a legal team is there to get them out of jail and help minimize the State's punitive measures. The presence of medics allows individuals and groups to take risky actions that may lead to bodily harm knowing that someone will be there to care for them if they are injured.

In order to operate effectively, it is important that medics organize themselves within the community in which they operate. This means familiarizing yourself with the existing organizations that carry out political actions and provide mutual aid.

Non-Hierarchical Organizing

No matter how you organize and who you work with, as an anarchist you should adhere to the principles of non-hierarchical organizing. Medics and those they work with have different domains of knowledge, different education (both formal and informal), and different levels of experience. This is especially true for medics who may be working on teams with doctors who have never been to a riot or protesters who only know the basics of first aid they've picked up on their own.[i]

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[i] As an aside, use of "first-aider" as a term for medic is discouraged because it creates an unnecessary differentiation between medics who are professional or highly certified and medics who are not. To the public, it can also give the impression that medics are a haphazard assembly of individuals who only minimally know what they are doing. Use of the term "medic" as the general classifier for those who provide medical care during actions is suggested.

Non-hierarchical organizing means that there is no decision making hierarchy when it comes to organizing, planning, and acting during mobilizations. It is important to come to consensus for both long-term planning and what will be done at any given action. Even during an action, medics must remember that they are free to choose how to act, as are others. If someone becomes uncomfortable with a plan or the situation, they are free to choose to take a course of action that may not fit in with what was previously decided. You should neither give nor obey orders.

However, for administering care, especially in emergency situations, the ranking of skill level, experience, and certifications must be respected. Additionally, decision-making protocols should be structured in a predictable way. Knowing who the primary care giver is and who the secondaries are when handling patients prevents valuable time from being wasted. That said, it is important to remember that less experienced medics may still be able to see something more experienced medics don't.

The protocol you use for handling a patient may be the first to arrive is the primary care giver until overridden by someone with more advanced medical knowledge. The presence or absence of overrides should be clearly established before attending an action.

Riot Medics Within Emergency Medicine

As a riot medic, you are part of the larger emergency medical care system operating in your city. You may need to consult local laws to understand when you can be relieved of duty by other medical professionals such as Emergency Medical Services (EMS) personnel arriving on the scene. Riot medicine inherently means operating under conditions that are adverse to administering prompt and ideal care for patients. There may be police blockades that do not allow ambulances through, or EMS movements may be disrupted by your comrades' actions or those of your opponents. Evacuations for critically injured patients may be necessary, and it best to ensure that cooperative interaction with traditional EMS is not jeopardized by repeated friction with riot medics. Failing to adhere to standard protocols for emergency medicine may cause problems or delays during future interactions. A scenario that should be avoided is an unwillingness to work together between traditional medical personnel and riot medics. This may endanger patients' lives.

Such failures tend to be rare, and you may find that traditional EMS has the opposite reaction to the work done by medics. They may be willing to support you even if they cannot do so officially, either by making their ambulances available for rapid response during large actions or by providing material support.

The Buddy Pair

While acting as a medic, you may work as part of a medic collective, be embedded in an affinity group, or work as an unaffiliated individual. No matter how you choose to operate, you must always work with a buddy. You may have different buddies during different actions, and you may shuffle buddies with other medics during a given action as changing situations may require. Your buddy does not have to be a medic themself, and they may simply be a comrade you can pair up with at actions.

Figure 2.1: Buddies[12]

Medics should not operate alone. This, like many other directives about how to operate, is not ironclad, but is a guideline that is most always applicable. However, as someone who may be new to riot medicine or street protests in general, it is inadvisable for you to operate without a buddy.

The buddy pair is the fundamental organizational unit for medics. You and your buddy are responsible for looking after each other's well-being (both physical and mental) before, during, and after an action.

A medic does not separate from their buddy during an action with the exception of multiple patients in close proximity requiring care. You cannot take care of your buddy, and they cannot watch out for you when you are not together. Separating endangers both parties.

Some common responsibilities you and your buddy have toward each other include:

- Being a second set of eyes while scanning for patients or danger
- Providing a second perspective or opinion for a situation (medical or otherwise)
- Being the devil's advocate or voice of caution
- Dividing equipment and carrying redundant equipment
- Double checking equipment
- Reminding the other to eat and drink
- Being alert while the other rests
- Controlling a crowd while the other assists a patient
- Preventing people from taking photos or videos of a patient
- Being a secondary for two-person CPR
- Assisting with moving or carrying a patient
- Communicating with EMS, other medics, or other groups while the other is helping a patient
- Debriefing each other at the end of the day
- Supporting each other's mental health in the long-term

As an Individual Medic

If there are no existent medic collectives and there are no groups with medics operating in your area, you may choose to start your venture into riot medicine as an individual. This may be an option you find appealing even if there are existing groups as there is no organizational overhead for grabbing a bag and going to demonstrations when you feel like it.

Whatever the reason is for operating on your own, you should nevertheless make connections and contacts with existing groups and comrades in your area. New faces are expected at public events, but there is some amount of implied authority and trust that goes with medics, especially if they are uniformed. Anarchist and left-wing movements must always be cautious against informants, and your presence without coordination may arouse suspicion. For more on informants, see Chapter 32 ("General Tactics").

Connecting with local organizations and activists will also let them know that you are a resource that can be relied upon for actions. If you are predictable, your presence can encourage people to come out to actions, and it can create a willingness for comrades to take action they otherwise might not.

The disadvantage of working alone is that there is no one to pick up slack if you are unable to attend actions, especially if you have made a commitment to support one. You may also feel pressured to attend all actions to prevent any one from being without medical support. Both of these can lead to burnout, especially if you do not have other medics to debrief with after actions.

As Part of a Collective

Organizing as part of a collective comes with many advantages over operating alone. You will work with and get to know others with different experiences with whom you can share skills. Working with a group diffuses the obligation to attend every action across many individuals. Caring for traumatized and brutalized patients can take an emotional toll on individual medics, and having a supportive group where you can discuss these events with others will help reduce emotional stress.

As some collectives become more established, they may choose to formalize themselves with the State and register as a nonprofit organization in order to better solicit donations. Even without the legal status of a nonprofit, the existence of a named, organized collective can encourage comrades to support you financially. Equipment and restocking supplies can be expensive, and your community may be able to help you.

Some collectives choose to remain more nameless and may simple be known as “the local medics.” Before you establish yourself as a public group with a recognizable name, you may want to consider whether name recognition within your community is worth the associated risks of name recognition by fascists and the State. You should also be cautious of joining a group simply because they already *do* have a name. Notoriety does not necessarily imply actual utility within the community. Be useful, not important.

With Other Individuals and Collectives

For larger actions and mobilizations, there may be many medics groups from surrounding regions operating together to provide medical support. These medics may be individuals, or they belong to collectives or affinity groups. For a single action or short mobilization, many groups and individuals working together as a temporary unit is called a working group.

Working groups will pool knowledge and come to agreements on how to best serve the community given their different skill levels, comfort zones, and tactics. Some medics may want to embed themselves in the Bloc, and others may be more risk averse and wish to be clearly marked and on the sidelines. Medics who cannot be as physically active may want to set up water and first-aid stations for actions. The working group will consider everyone's abilities and goals and find a way to allow the different individuals and collectives to operate symbiotically while maximizing available medical support for protesters or demonstrators.

Even for smaller actions, you should be aware of other medics in your region. Check in with them before actions to see if they will attend, and during actions make sure you're aware of each other's presence. Piling all the medics at the front of a large march might not the best use of resources, and you may want to coordinate to get better coverage.

Bylaws, Codes of Conduct, and Consensus Statements

Long-running collectives and temporary working groups may want to consider adopting bylaws and a Code of Conduct (CoC). Bylaws define the responsibilities an individual has toward a collective or working group. Bylaws include things like requiring attending a certain percent collective meetings or how consensus can be reached by the collective. A CoC defines the responsibilities an individual has towards members of the collective, working group, and community. CoCs include things like statements against harassment, discrimination, and abuse.[ii]

Collectives are encouraged to spend some time developing their own CoC as it helps the group define themselves and establish shared ethics. A CoC is also a means of ensuring inclusion by stating that harassment or willful insensitivity toward someone's identity are not tolerated.[iii] Working groups are shorter lived, and it may not be worth spending time to define a bespoke CoC. Use of a template may be preferred.

[ii] The Tor Project has a robust CoC[13] (archive: `https://archive.is/IiyG6`). Another example is the Citizen Code of Conduct[14] (archive: `https://archive.is/7VS6s`).

[iii] Some opponents of CoCs claim that they are a purely US phenomenon and that exporting them to the rest of the world is some sort of US-left-hegemony over the sovereignty of non-US left movements. These same people tend to think that being an asshole is ok because it's "freedom of expression" or that others need to toughen up. People like that can fuck off. Be gentle with each other so we can be dangerous

Because different collectives and individuals may have different sets of tactics and ethics, a medic working group may want to develop a consensus statement in preparation for a large action.[iv] This consensus statement is a formal declaration of intent of action as well as a political stance, and it is made public ahead of the action. Such a statement may include specifics like affirming that the medics will not collaborate with police. Consensus statements may also choose to define medics as neutral parties and request that all medics refrain from displays of political alignment, or they may define medics as active members of the action.[v] Coming to consensus helps prevent post facto arguments over individuals' actions, and it gives the public a sense of what to expect from medical support.

The St. Paul Principles

The St. Paul Principles[vi] are a set of guidelines for political organizing in the face of political repression. They may be used on their own as part of a consensus statement, or you may find them useful for adding to a CoC. The principles are listed in their original form below:[17]

1. Our solidarity will be based on respect for a diversity of tactics and the plans of other groups.
2. The actions and tactics used will be organized to maintain a separation of time or space.
3. Any debates or criticisms will stay internal to the movement, avoiding any public or media denunciations of fellow activists and events.
4. We oppose any state repression of dissent, including surveillance, infiltration, disruption, and violence. We agree not to assist law enforcement actions against activists and others.

Regardless of how you organize, or what type of actions you attend, the St. Paul Principles are a good guideline for considering how you

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together.

[iv] Examples of street medic consensus statements for a mass action can be found on the NYC Action Medical website[15] (listed as "Points of Unity") and the Ende Gelände website[16] (archive: `https://archive.is/l7HRh`).

[v] For a full discussion of neutral vs. partisan medics, see Chapter 32 ("General Tactics").

[vi] The St. Paul Principles came out of the political resistance to the Republican National Convention (RNC) in St. Paul, Minnesota in 2008. The principles were agreed upon by the various groups that were organizing together in order to maximize their collective impact. These principles have endured in anarchist and non-anarchist circles in part because they effectively counter State disruption of organizing.

operate with other groups and individuals. Different individuals and groups will be willing and able to take different kinds of actions, and everyone's actions can affect the safety and amount of repression faced by others. A full discussion of tactics is covered in Part IV ("Tactics").

Principle 1. The first principle is to respect diversity of tactics. Some medics may not be comfortable with violent confrontations, but that does not make them less valuable. They are entitled to determining their own level of safety. Additionally, some protest groups may not want clearly marked medics because it draws unwanted attention from law enforcement. You must figure out how you can provide support with or without other medics in a way that truly supports the spirit of the action you are attending.

Principle 2. Maintaining a separation of time and space is used to isolate legal risk, risk of repression, and risk of violence faced by participants and other medics. Your actions as an individual can affect all of these types of risk for individuals present. Walking around in a full EMS uniform with protesters who are trying to blend in may draw attention they do not want. Likewise, protesters will need to be aware of medical support and not drag them into confrontations they are not prepared to handle.

This extends to planning, and medics may not want to be directly involved in the planning of actions as they become a legal liability who can be interrogated about the actions. Some medics tactically choose to maintain separation from activists to minimize the chances of information leaking.

Principle 3. A common police repression tactic is to foment internal conflict within organizations to break down solidarity. For you as a medic this means avoiding criticizing individuals and groups, medical or otherwise, in a public way that can be used by police or media to show a divided movement. Animosity between medics and protesters may lead to people asking the question "Will they treat me or not?" This should be avoided to the largest extent possible.

Principle 4. Simply put, all cops are bastards. You may find it tactically advantageous to maintain a professional level of courtesy with local law enforcement to ease your job, but medics never provide information about comrades, organizations, or actions to the police or the State. Because you cannot trust strangers to not pass on information, you should avoid discussing anything related to the movement or action with people who are not known, trusted comrades. This includes medical professionals. EMS does not need to be told in advance where blockades may happen or on what days to expect an influx of emergency department admissions.

Summary

You may want to work on your own, or you may choose to join a collective. Whatever you do, work with a buddy, and coordinate with others. Do what you can to develop solidarity with those you work with, those you treat, and those in your community. Remember: our solidarity is a weapon.

3 : Pre-Action Planning

> It is better to have a bad plan than no plan.
>
> Garry Kasparov

Like all roles within a social struggle, medics' actions are constrained by time, money, access to material goods, and the often overlooked psychological limitations that lead to burnout. It is important to allocate resources in such a way that harm can be minimized to both medics and comrades alike in the short-term and long-term.

Planning involves gathering and collating relevant information and becoming familiar with it. Discussing the various outcomes and challenges helps reduce stress by decreasing the number of unexpected stressors medics might encounter.[18] When working in a collective, communication and planning become critical to the collective's long-term health and their ability to be effective during actions.

Long-Term Planning

Long-term planning is the process of planning out your or your collective's medic operations for roughly the next 3 months to 1 year. Failure to adequately plan on longer time scales may lead to the inability to support actions and organizations either through inattention or burnout.

It is useful to use a of calendar or spreadsheet to track different actions. To get an idea of when actions will be happening, first start with recurring actions. Are there holidays such as May Day (International Workers' Day) that have actions every year? Are there memorials marches for dead or slain comrades or other locals? What major actions have there been in the past? Answering these questions will help give you an idea of the spread of actions over the year.

It's also useful to look at major political actions in your region. Are there meetings for the G8 or other global capitalist organizations? What about elections? Looking at how your opposition organizes can give you an idea of what actions will have counter-protests you may need to support.

Your calendar may rapidly fill up, and you will need to prioritize which actions you or your collective will want to support. Questions you can ask that may be useful are: what amount of violence or repression there may be, what kind of action is it, and what is the demographic? Smaller, radical actions may need more medical support because of confrontations with the State or fascists, but also larger more liberal marches will have more elderly who may need need assistance.

Do not forget to leave some room for spontaneous or short notice actions. No matter how well you plan, things come up and get cancelled. Planning out the major events of the year can help you determine if you can support spontaneous actions or if doing so will cause you to go many weeks without a free weekend.

If you live in or near a major metro area, there may be actions you could support every day of the entire year or even multiple actions per day. You may be attempted to go out every evening and every day to support comrades, but this will likely burn you or your collective out. Not all actions truly need medical support, and even if they did, you cannot help anyone if you have burned yourself out. A good guideline is to start by supporting actions only as often as you truly feel that you can do sustainably. Maybe this means at most every other week. Over time, you may make more comrades and be able to support more actions. Avoid over-burdening yourself.

Contingency Planning

Even if protest is legal and rather safe in your region, the risk of arrest or serious injury is never zero. Far-right “lone wolves” may violently attack your protest, or police may decide they just don’t like your attitude and arrest you, possibly landing you in prison. Even as a medic, where these risks may be lower than the average protester, you still face some risk of imprisonment or serious injury. If you’re unlucky, police will heavy-handedly target medics with greater ferocity than other protesters.[i] Your close proximity to protesters facing massive State repression may make you a target for arrest. Because of these risks, you should make and share with comrades your contingency plans for what to do if you are injured, are arrested, or have your house raided by the police.

Leaving a single change of clothes at a comrade’s flat will ensure you have something comfortable to wear. If you are badly injured, EMS may cut your clothes off, and you’ll need something to wear when you leave the hospital. If you are arrested at an action, your clothes may become damaged, bloodied, or contaminated with riot control agent. If your home is raided by the police, you may not be able to get a change of clothes for several days. Having your own change of clothes for all of these situations may make you more comfortable and help restore some normalcy to your life.

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[i] Medics in the US are specifically targeted by the police for violence and arrest.

Consider talking to a lawyer who specializes in social movements and putting them on retainer. If you cannot afford this, consider finding a lawyer who may take on many clients from the same collective for a group fee. There may be non-profit legal assistance for people arrested during protests in your area.

If you have pets, give a comrade a key to your home, and tell them how to care for your pets. If your pets have special diets or medication, make sure your comrade knows about this, and leave a note somewhere obvious.

To minimize the longer lasting effects of arrest or a police raid, you may want to store a backup of your personal data off-site. One such practice is to encrypt a USB stick with a strong passphrase and use it to store all your cryptographic keys, passwords, and important documents. Seal the key in a waterproof container, and bury it somewhere obscure where nosy neighbors or pets won't find it. This protects against police seizure of your electronics and will let you get back into your accounts and communicate securely with your comrades.

You may want to come up with a media plan for what to do if you are injured, arrested, or killed. Do you want your situation politicized or not? Some people may want their lives to stay more anonymous, and others may trust their comrades to turn their misfortune into propaganda to advance the movement's goals.

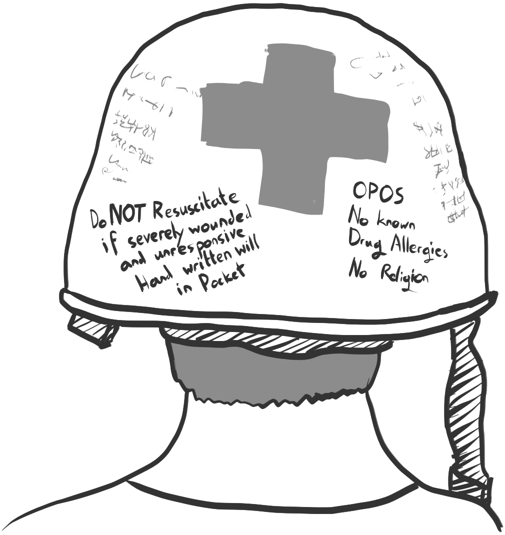
Planning for an Action

Not all actions require a great deal of planning, and many similar actions can be covered by use of standard operating procedures (SOPs). However, knowing how to plan effectively takes practice, so it can be useful to practice planning for smaller actions before you have to plan for larger ones. The larger the action or the more State repression, the more planning there will need to be.

Medic working groups for large actions may need to come up with a consensus statement, and this may take significant time to work out.

[ii] On October 1st, 2019, a photo surfaced of a medic wearing this helmet.[19] While this is not a legally recognizable Do Not Resuscitate (DNR), it shows the fear and desperation medics face during unrest and repression.

Figure 3.1: Contingency Directives[9,ii]


Do NOT Resuscitate
if severely wounded
and unresponsive
Hand written will
in Pocket
OPOS
No known
Drug Allergies
No Religion

Failure to come to agreements early may lead to some groups choosing to not participate. They may feel that a lack of consensus or a consensus they do not agree with violates their ethics or may endanger them.

1 Week Before

Roughly one week before an action, a general plan for the day should be made to give everyone involved an idea of what will be happening. The following questions should be answered:

- Where is the action taking place?
- What time is the action scheduled to start? Will there be “unofficial” actions before the main action?
- What time is the action scheduled to end? Does it have a chance of running late because of repression or “unofficial” actions after?
- How many people (comrades, law enforcement, opposition, bystanders) will attend?
- What type of repression is expected?
- What is the route? Have other routes been used in the past? Will groups splinter and use side roads?
- Are there locations (parks, monuments, buildings, memorials) where there are regular confrontations?

- What is the expected weather?

These questions will help you plan your travel, equipment, attire, and marching position relative to the main body of the protest. Answering these questions in advance helps reduce stress from uncertainty and the unknown in the days leading up to the action. As you become more experienced, and as you develop SOPs and a routine, you will have a deceased need to plan for each action.

Equipment reserves should be checked. Ensure you have all the medical and other supplies you will need. Doing this a week in advance will give you time to acquire them.

If you need to, arrange transport and accommodation. If the action is in your region, consider offering accommodation to other comrades. For large actions where more planning is needed, you may want to do this more than 1 week in advance.

For larger mobilizations, this kind of broad planning will need to take place even further ahead of the event. It should include a plan for how to distribute medics, coordinate between medics, and whether or not there will be fixed aid stations at the action.

1 Day Before

The day before the action, you should check that the broad plan you came up with still applies. Have organizers made major announcements? Is there an influx of people from out of town who will arrive? If it looks like the environment or major details of the action have changed, you may need to modify your plan.

Do a final equipment check and pack your medic bag. If you are missing supplies, acquire them or find another medic who can bring them for you.

Print out maps of the major areas areas where the action will take place. These should be detailed enough to include side streets, alleys, dirt paths, and trails. Mark these with with the route or major points of the action as well as information about the opposition, if there is any.

Double check your travel plans. Check for construction, strikes, or outages that may prevent you from getting to the action on time.

Find an emergency contact who will not be at the action who you will check in with at the end of the action. If the entire action is mass arrested, you will need someone to help carry out your contingency plans.

If you shave or buzz any of your hair, do so the day before to allow micro-cuts to heal in the event you are pepper-sprayed or tear-gassed. If you have significant facial hair, consider buzzing it down to the shortest stubble possible or shaving it off to help your respirator achieve a better seal.

Eat well, drink water, and do what you can to get a good night's rest. If you are staying with comrades or they are staying with you, consider sleeping with ear plugs to be as fresh as possible in the morning. Stay off your mobile phone. Mobile phone use at night is linked with worse sleep and daytime dysfunction.[20]

Day Of

Avoid wearing makeup or using skin products with oil in them, and remove any residue left over from the day before. Avoid using oil-based sunblocks. Oil will bind riot control agents to your skin. If it will be sunny or warm, apply water-based sunblock.

If you have piercings, consider removing them. Piercings can get caught and torn out during an action. They can also be used to help identify you either by police or fascists. If you have gauged ears, removing the plug will leave an open loop of skin that can still be caught or grabbed. You may be better off leaving a solid plug in your ear or taping over the skin with medical tape.

Remove rings from your fingers to prevent degloving when climbing or lifting objects.

Do a final bag and gear check. If possible, do this with your buddy or members of your collective.

Again, make sure you eat and hydrate. If you are nervous, you may not feel hunger or thirst, but it is important to eat and drink anyway. You may need to eat and drink despite anxiety or stress related nausea. Six hours into the action, you will be glad you had a meal beforehand. Make sure your buddy eats and drinks, and do so respecting their autonomy, sensitivity to eating, or possible eating disorders.

Check-in with your buddy, collective, or working group. Talk about how you are feeling and how this may affect you during the day. Do not be ashamed if your personal life or lingering trauma from other actions prevents you from operating at what you think is full capacity. Share this with your comrades so that plans can be altered to accommodate you.

Go over the plan one last time.

Arrival

At the action, check in with other medics and organizers. See if there are points of interest you want to mark on your map. Decide on duties for the day. Review the contents of each other's medic bags so other medics can easily find equipment. Set up check-ins. Go over the plan one last time to see if there is new information.

Good luck and FTP.

Summary

Contingency planning helps mitigate the effects of injury, arrest, and repression. Long-term planning is useful to ensure support is available for major actions and to prevent individual burnout. Short term planning for an action is most useful early in the life of a collective until standard operating proceduress (SOPs) or routines emerge. It generally continues to be useful for larger actions due to the sheer amount of coordination required. Plan as a means of reducing your own stress.

4 : Post-Action Tasks

> Now we go quiet; the fight has begun. There is a hill and I shout as I run forward: To Versailles! To Versailles! Razoua tosses me his sword to rally the men. We shake hands at the top; the sky is on fire, and no one has been wounded.
>
> Louise Michel, *Mémoires*[21]

Your duties as a medic are not done when you leave an action or even when you get home. Immediately following an action is the best time to start preparing for the next while things are still fresh in your head. A very small amount debriefing and preparation can drastically reduce the amount of work you have to do before your next action. Taking the time to talk with comrades can also help with your mental health and the mental health of your comrades. For more on psychological first aid, see Chapter 8 ("Psychological Care").

Buddy Check-In

At the end of the action, check-in with your buddy. This may be as simple as asking "Everything good today?" If there were traumatic injuries, violence, or other stressful events during the day, try to talk about it with your buddy, but don't force a conversation they do not want to have.

Additional information on the kind of care you can provide for one another following traumatic events can be found in Chapter 8 ("Psychological Care").

Debriefing and Retrospective

Shortly after the action, or in the days following, your collective or working group may want to hold a longer discussion about the action. This is sometimes called a debrief or retrospective. Retrospectives help individuals and groups identify successes as well as things that could have been done better so that future actions can be handled with fewer mistakes.

If you are part of a multi-day action, you should consider holding short debriefs after each day so that improvements can be made for the following day.

An important part of the retrospective is to ensure that they are blameless. Many times the perceived failings of an individual were due to systemic failings of the collective at large. If someone was in the wrong position and got kettled, was this because of poor planning or bad communication? The purpose of the retrospective is not to "name and shame," but to understand the root cause of an error so that it may be avoided in the future.

It's useful to do a round where all members quickly say what they felt went well, was difficult, and what could be improved. This is followed by an open discussion about how the things that went well can be repeated as well as how to restructure the collective or plans so that errors are not repeated.

Holding retrospectives that are friendly and non-adversarial helps build trust among members of the collective or working group.

Community Coordination

If there is legal or anti-repression support in your region, you may want to contact them to report your findings. This may mean the names of arrested comrades who need jail support, or it may mean reporting aggregate counts of injuries for publishing.

Emergency Contacts

If any emergency contacts are waiting on you, make sure you contact them to let them know you are home safe. If you are anyone's emergency contact, consider reaching out to them to check if they made it home safely.

Decontamination

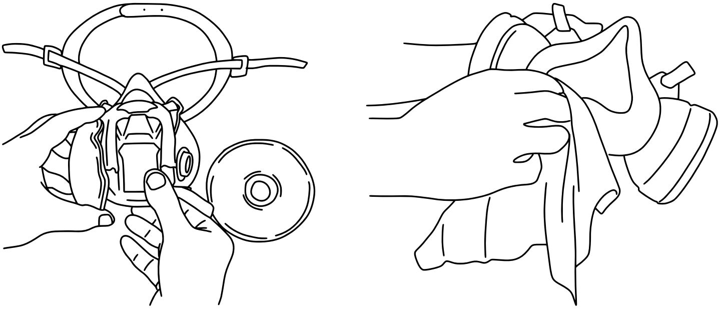
After you have gotten home, you may need to fully decontaminate all your equipment from riot control agents (RCAs). Full instructions can be found in Chapter 13 ("Riot Control Agent Contamination"). It is important to do this immediately to minimize the spread of RCAs into the rest of your home. Failing to immediately decontaminate may lead to you using contaminated equipment during your next action.

Equipment Check

When you get home from an action, you should at a minimum make a list of all the supplies and equipment you will need to restock before the next action. List all single use supplies that were used up during the action such as gauze, bandages, or batteries. Additionally, list any supplies that were damaged of confiscated.

As mentioned before, if riot control agents were deployed during the action, you will need to decontaminate your bag, its contents, and your clothes.

Figure 4.1: Respirator Cleaning[12]



(a) Remove Filters (b) Wipe Down

If your helmet or eye protection was struck with anything, check it for damage. Helmets are often designed for only one impact, and they may have significantly degraded protection once struck. If you have a full face respirator, check the visor for cracks and other damage.

If you have replacements for anything that was used during the action, restock your bag. If your bag became disorganized during the action, reorganize it. Plug in any devices that need to be recharged.

Eyewash bottles and water bottles should be emptied, cleaned, and left to dry for the next action so that mildew does not grow in them.

Decompression

After you have cleaned up, don't forget to take care of your body and mind. Eat, hydrate, and relax. You may want to stretch after a long day to help alleviate muscle tightness. You may find yoga or meditation calming, or you might want to watch movies with friends or go for a swim. You know what you enjoy and find relaxing, and it is important to take care of yourself too.

Summary

Preparing your equipment for the next action immediately following an action is useful because it makes it easy to grab your bag and run should something spontaneous happen. Taking care of other loose ends and decompressing allows you to mentally close out the event and move on to your life outside of being a medic.

5 : Training

> Responsibility and discipline must not frighten the revolutionary.
>
> Nestor Makhno, *On Revolutionary Discipline*[22]

Reading material and studying theory is not sufficient training to be an effective riot medic. Hands-on and other practical training is necessary to be able to quickly and correctly render care. Maintaining a baseline level of fitness is also recommended since riot medicine is inherently much more physical than clinical or other emergency medicine. Training with your equipment and comrades will give you the familiarity and skill you need so that instead of focusing on the mechanics of moving with a crowd or applying a bandage, you can focus on the higher level analyses like police and Bloc movements or diagnosing an illness.

Practical Training

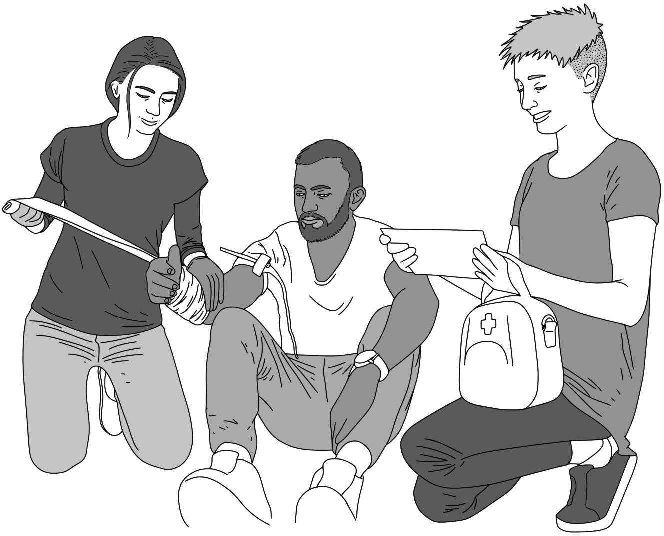
Practical training is the complement to studying medical theory. It means actually going through the mechanics of diagnosing and treating injuries and illnesses.

Practical training is necessary to quickly and correctly render care to patients. Professionalism in care helps make patients more comfortable during treatment and will help build trust that you can be relied on to care for patients in more serious situations. Beyond this, lacking familiarity with your equipment can inadvertently injure patients while caring for them.

Things you should consider practicing with a buddy or your collective are:

- Bandaging different wounds
- Immobilizing fingers, limbs, and joints (especially wrists, elbows, shoulders, and ankles)
- Washing pepper spray from a patient's eyes
- Carrying patients

Figure 5.1: Training Together[12]



Doing these with the supervision of a more experienced medic will help teach you how to correctly bandage wounds so that a protester may continue to take part in an action without ripping off a bandage or exposing their wound.

It is especially important to practice decontamination of the eyes from riot control agent. You will need to practice using your fingers to hold a patient's eyes open while flushing them with water. Practice with "live fire" and actually spraying volunteers is incredibly useful as it will teach people who have never been sprayed before what to expect, and it simulates the actual panic and mishaps (such as medics getting pepper spray in their own eyes) you will see at actions. It is especially important for you to practice eye decontamination on yourself so that you can flush your own eyes if necessary. If you are the only medic, you need to be able to care for yourself so you can care for others.

While it is not expected that medics receive formal training or State recognized certifications, one advantage of taking a formal course is that you will have the opportunity to practice CPR on training mannequins to get a feeling for the mechanics of chest compressions and ventilation. Certifications may also provide legal protection for you as you practice medicine, and they may allow you to have a wider scope of practice.

Formal courses also offer practice on diagnosis where an instructor selects an illness and makes the medic diagnose what has happened, explain their reasoning, and propose treatment for the patient. This can be done with your collective if you have medics who are experienced and comfortable leading drills of this nature. Practicing handling, diagnosing, and treating patients is critically important, especially for medics who do not work as medical professionals.

In addition, your training needs to be ongoing, even if just to refresh skills. A 2012 study followed students who took a wilderness first aid course (the closest one can get to a riot medicine course) and tested their skill retention at 4, 8, and 12 months. It found that there was a decrease in competency of practical skills and that a participant's self-confidence did not correlate with their actual skills.[23] Your skills and knowledge may degrade without you realizing it.

Training with each other in the backyard of a local squat is useful, but there is no substitute for actually doing the thing. Experience is the best teacher, so getting out to actions will hone your riot medicine skills faster than anything else. Going out to small, less exciting actions will allow you to practice treating patients and moving through a crowd without flying bottles and risk of arrest.

Team Building

Doing practical training with your buddy or collective is a form of team building that serves to build trust in each other's abilities as well as familiarity with working with each other. Practicing communicating and quick decision making will help you in the field while a crowd moves rapidly or many patients need to be treated.

Many medics bring their own equipment to actions even when part of a collective, or some equipment may be shared among collective members. Training together allows medics to familiarize themselves with the different packs and gear everyone else has. This is useful so that during an action if someone says "I need gauze," the other medics know what it looks like and where in a pack it is located.

Team building also may take place in other formats like entertaining group activities.[i] Some medics have found utility out of playing board games because it is an exercise in cooperation and creative thought around strategy without becoming lost in endless hypotheticals.[ii]

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[i] Sometimes called "friendship."

[ii] I find the board game *Bloc by Bloc* to be useful for this as it is cooperative, deals

However, much of this team building is not strictly necessary and serves as an aid in building trust and solidarity. Medics who are often in the field together will naturally build a sense of unity in an organic way.

Fitness

Taking part in an action can be physically taxing, especially if it lasts many hours or takes place in inclement weather. The degree to which a medic becomes exhausted during the course of their duties can be lessened by increasing their fitness beforehand. It is not a requirement that medics have fitness, nor is this meant to be a criticism of or value judgement against those who do not want to or cannot train. Fitness is merely one tool of many in a medic's toolbox, and a small amount of fitness can be extremely advantageous.

There is no arbitrary cutoff or criteria for fitness, and lack of fitness should not disqualify someone from becoming medic. There are simply some tasks that require a degree of endurance and strength. An inability to keep up with a quick moving protest can make it impossible to render care if the main body outpaces the medics. Being able to lift patients makes it possible to evacuate them. Core strength can help prevent tiring or straining back muscles from carrying a backpack all day.

Some goals that are worth working towards are:

- Using a two-person carry, carry a patient 100m
- Run quickly for 5 minutes
- Jog for 20 minutes
- Walk for 4 hours with a backpack without a break

If you can can accomplish these without feeling tired, cramped, or exhausted or being on the edge of muscle failure, you will have more than enough fitness to carry out your duties. If any of these trouble you, even with as little as an hour of working out per week (one 1-hour session, or two 30-minute sessions), you may be able to make significant improvements in a few weeks. Light jogging plus core exercises is generally all that is necessary for training. Hiking and bouldering are group activities that are more fun than running laps around your local park.

In general, training in the heat will build heat adaptation and help prevent heat illness during hot actions. See Chapter 22 ("Heat Illness") for more information.

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with common protest concepts, and (as a bonus) is based on fighting the police.

There are many ways to become more fit, so find what works for you. Guidelines for writing a fitness plan is outside the scope of this book.

Summary

Reading this book is not enough to prepare you for being a medic. Practical training is strongly encouraged, and practicing diagnosing and treating patients with other medics is a skill that can only be learned by practice. All medics, especially novice medics, are encouraged to go out to many demonstrations and use them to hone their skills.

Part II

Medicine

6 : Patient Assessment

> Medicine is not only a science; it is also an art. It does not consist of compounding pills and plasters; it deals with the very processes of life, which must be understood before they may be guided.
>
> ---
>
> Paracelsus

Patient assessment is the process you will use to investigate a patient's symptoms, make diagnosis, and select treatment options relevant to their injury or illness. This process is used by lifeguards, EMTs, doctors, and medics around the world. When followed, the patient assessment system will allow you to make quick decisions and to effectively communicate findings to other medical professionals who may assist with or take over care of your patient.

Homeostasis is the regulation of different chemical and physical properties of the body within a narrow range that allows the body to function. This includes temperature, fluid balance, sodium concentration, and blood pH balance. Illness and injury can cause homeostatic failure, and the signs and symptoms of these failures give insight into the patient's underlying condition. The patient assessment attempts to narrow in on the cause by looking at these symptoms.

The steps described in this chapter do not always need to be followed completely or in the order provided. For treatment of minor injuries where the patient is alert and oriented and they know exactly what happened, it may be sufficient to treat their single injury without conducting a full examination. In the context of riot medicine, following these steps completely is most applicable for patients with trauma and illnesses with rapid onset. Regardless, it is good to memorize these steps so that you can quickly walk through a mental checklist and at the very least ask yourself "Is this step relevant to the current situation?"

Scene Size-Up

Your assessment of the patient begins before you even see or hear them. Environmental information will serve as your starting point for what may have gone wrong. The weather, the type of action, the demographic attending the action, and the presence of police or other opposition will give you a starting point about the types of illnesses and injuries to expect.

Once you have identified a patient, either by them coming up to you, or you spotting someone who appears to need care, look around for possible causes of injury. Are they approaching you on their own, or did they need to be carried over by someone? Are they standing or laying down? What have the police been doing? What is the crowd in the vicinity doing? These will provide clues about their illness or injury.

Scene Safety

Before you attempt to render care, ensure that the scene is safe enough for you to do so. You cannot help anyone if you become a casualty yourself. Look for environmental dangers like burning petrol or downed power lines. Also be aware of threats from police or opposition. If your action was attacked by someone in a vehicle, ensure the vehicle is no longer a threat before approaching victims. If someone was assaulted by nationalists, you may need an impromptu security detail and spotters to keep you safe while you render care or perform an evacuation.

If the scene becomes unsafe while you are caring for a patient, you will either need to leave so you do not become another casualty or rapidly evacuate the patient. You cannot help anyone if you are incapacitated through injury, and you will add to the burden that other medics face.

Mechanism of Illness or Injury

Attempt to identify the possible mechanism of injury (MOI). The MOI will give you clues about what types of injuries the patient has and how severe they may be. Is it possible the person fell from a height? Do they appear to be contaminated with a chemical agent? Have police been firing rubber bullets, tear gas, or flashbang grenades? If the patient is unresponsive, ask people around the patient if they saw what happened.

Look and see how many people are injured. If there is more than one, you will need to quickly triage the situation and determine who is most in need of immediate care. Steps for triaging mass casualty incidents can be found later in this chapter.

Observe the patient. Do they appear to be awake and alert, or are they slumped over or disoriented? Are they holding an injured extremity? Do they appear to be in great distress or are they relatively calm? None of these questions or observations will completely determine your diagnosis or treatment. They are merely a starting point.

Body Substance Isolation

Body substance isolation (BSI) is the set the precautionary measures taken to reduce the transmission of disease via mucous membranes and moist body substances. In the context of riot medicine, this primarily means wearing gloves whenever touching a patient. You may want to wear a surgical mask and eye protection while caring for patients to reduce the risk of contracting disease if the patient has blood that is spurting or if you have a compromised immune system.

If you suspect that someone will imminently need medical care, you may want to preemptively put on your examination gloves. Possible scenarios include increasing aggression between protesters and police or a march accelerating as it approaches their opposition. Even if you are not able to immediately reach a patient or potential patient, or if they later refuse care, you may still be glad you preemptively donned your gloves. This is a better alternative than fumbling with tight gloves and sweaty hands as a situation becomes critical.

Consent

Before you touch or begin treating a patient, you need to obtain their informed consent. Every person has the right to their own bodily autonomy, and you need to get their permission before assisting them. To do this, introduce yourself and state your qualifications. If you are uncertified, the patient has the right to know this. Do not overstate your credentials as this violates the “informed” part of “informed consent.”

If the patient appears to be unconscious, say hello. If they do not respond, say hello loudly and shake them. If they still do not respond, attempt to wake them with a painful stimulus. Instructions follow later in this chapter. If they still do not respond, you have permission to treat them through what is known as implied consent.[i] Implied consent is the assumption that any unconscious person or person in an altered mental state would want to receive aid in an emergency situation.

Primary Assessment

The primary assessment is performed on all patients and rapidly identifies life-threatening medical problems. Memorizing this protocol gives you structure during the first moments of an emergency. During the primary assessment, the respiratory and circulatory systems are examined and managed, the spine is protected if the MOI indicates possible spinal injury, and major wounds are exposed and treated.

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[i] Implied consent may not be a legal concept in your region. You may need to do your own research.

ABCDE

The primary assessment uses the mnemonic ABCDE to to remind the medic of the main steps of the process: airway, breathing, circulation, disability, and expose/examine injuries. These step do not always need to be done in this order as different circumstances might dictate different checks first.

Table 6.1: ABCDE

A	Airway
B	Breathing
C	Circulation
D	Disability
E	Expose/examine injuries

To begin your primary assessment, approach the patient and obtain consent. If the patient is not responsive, and the MOI is either uncertain or suggests a spinal injury, you will need to move the head and neck to a neutral position and stabilize the cervical spine. Protection of the c-spine should not take precedence over more immediately life-threatening conditions. A rule of thumb is to treat what kills the patient first. A full description of how to immobilize and protect the c-spine can be found in Chapter 15 ("Brain and Spinal Cord Injuries").

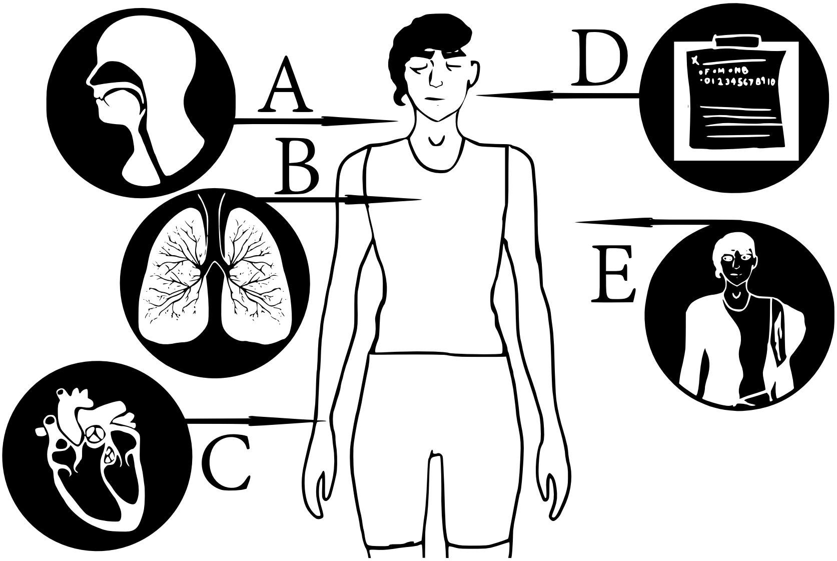
If you are working with a buddy, one medic protects the c-spine, and another medic performs the rest of the primary assessment. If your buddy is not medically trained, instruct them on how to stabilize the head and neck while you perform the other checks.

When you are checking a patient's ABCDEs, if you find that they have no pulse or are not breathing, you will need to begin artificial ventilation or cardiopulmonary resuscitation, together known as basic life support (BLS). Instructions for how to perform BLS can be found in Chapter 11 ("Basic Life Support").

Airway

The respiratory tract (airway) is the path air travels through from the atmosphere into the lungs and back out. The upper respiratory tract is the mouth, nose, pharynx, and larynx. The lower respiratory tract is the

Figure 6.1: Patient Examination[24]



trachea, bronchi, and lungs. If this path becomes blocked, oxygen cannot reach the lungs and enter the bloodstream. This is a life-threatening medical emergency.

If your patient is responsive ask them to open their mouth. If they are unresponsive, open their mouth. Check for objects that may block the airway such as food, vomit, dirt, or dislodged teeth. If you find something, remove it. If there is liquid in their mouth, you will need to roll them into the rescue position to drain it, or use a manual suction pump. Rolling the patient is covered in Chapter 15 ("Brain and Spinal Cord Injuries"), and the rescue position is covered in Chapter 11 ("Basic Life Support"). Check for inflammation that may narrow the airway.

In an unresponsive patient, you will need to open their airway. If they do not have a suspected c-spine injury, open their mouth with the head-tilt maneuver. If they have a suspected c-spine injury, open their mouth with the jaw-thrust maneuver. See Chapter 11 ("Basic Life Support") for details on these maneuvers and opening a patient's airway.

Breathing

If your patient is responsive, ask them to take a deep breath. If their breath is labored, painful, or noisy, they may have a chest or lung injury. Inspect their chest and for traumatic injuries. Touching this part of the body may be psychologically or emotionally uncomfortable for the patient. Reaffirm consent before proceeding. You may need to remove clothing to do this; however, it may be unwise to remove clothing at an action because you may need to redress them to protect them from police violence, and exposing their body could reveal identifying features and tattoos.

If your patient is unresponsive, lean down, put your cheek near their mouth, and put one hand on their abdomen. Look, listen, and feel for signs of respiration. Look for the rise and fall of their chest and abdomen. Listen for the sound of air moving in and out of their mouth and nose. Feel for air moving against your cheek. If their breathing is shallow or irregular, check for injuries to the chest.

A patient with no circulation (cardiac arrest) or a stroke may still have agonal respiration. Agonal respiration is gasping or labored breathing as brainstem reflex to a lack of oxygen in the brain. It should not be confused with normal respiration as it is not sufficient to deliver oxygen to the body.

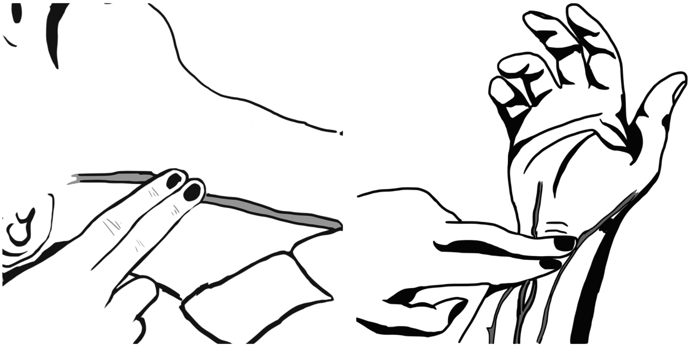
Circulation

Check for the presence of a pulse. If your patient is responsive or breathing, use the radial pulse. If your patient is unresponsive, use the carotid pulse. Check their pulse for at least 10 seconds. This is necessary as a patient may have a weak pulse because of shock or hypothermia.

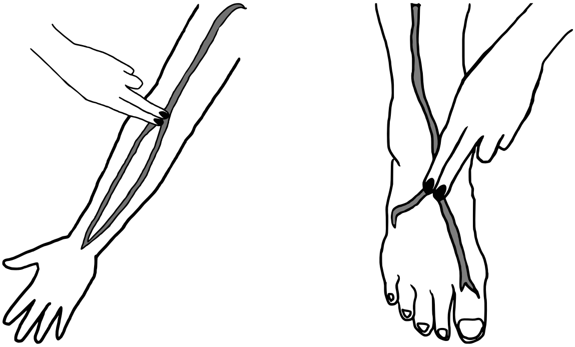
When checking for a carotid pulse, check on the side of the neck nearer to you, so you do not accidentally appy pressure to the trachea. If you cannot find the carotid pulse, check for the radial, brachial, or femoral pulse (Figure 6.2). Some first aid texts suggest using the pedal pulse, but this is not recommended for medics if there are other options. The pedal pulse is more difficult to locate and requires removing shoes and socks. Checking the carotid artery for a pulse is advantageous as it can be done simultaneously while you check for signs of breathing.

If you or your buddy has a pulse oximeter, while one of you is checking for the pulse manually, the other should attach it to one of the patient's fingers before moving on to assist with other parts of the primary assessment (Figure 6.3). Pulse oximetry is coverd in more detail later in this chapter.

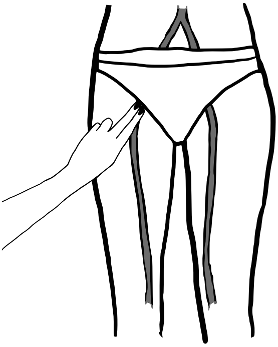
Figure 6.2: Arteries for Checking Pulse[24]



(a) Carotid Pulse (b) Radial Pulse



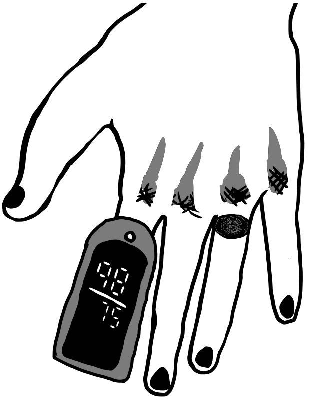
(c) Brachial Pulse (d) Pedal Pulse



(e) Femoral Pulse

Note that during this step you are simply checking for the presence of pulse to determine if the patient is in cardiac arrest. Quality and regularity of the pulse are investigated during the secondary assessment.

Figure 6.3: Pulse Oximeter Application[24]



Disability

Consider disabilities the patient may have that may cause or exacerbate their injuries.

If the MOI suggests a spinal injury, immobilize the patient's head and neck. This is done to protect the spinal cord and prevent permanent disability or paralysis. A more complete guide on how to treat suspected head and neck injuries can be found in Chapter 15 ("Brain and Spinal Cord Injuries").

Check if the patient appears to be having a diabetic emergency. Test their blood for hypoglycemia and hyperglycemia, and consider administering glucose. Treatment for for this can be found in Chapter 25 ("Blood Glucose Disorders").

Expose/Examine Injuries

Check for bleeding. If the patient has a suspected head or spinal injury, do not move, shift, or roll the patient during this process. Check underneath clothing for traces of blood. Move your hands under the patient's arms, legs, and torso and look for traces of blood on your gloves as an indication of bleeding between checking each location. If you find hemorrhaging, this needs to be managed immediately, including before beginning CPR or artificial ventilation.

Examine the patient for additional injuries and expose them for further treatment. You may need to remove or cut away bulky clothing. Removing or cutting away clothing can have privacy concerns as it may expose a patient's tattoos or identifying birthmarks. Patients may be unhappy if their clothes are cut away, especially if it is unnecessary. If the patient is awake and an injury does not appear life-threatening, you should explain what you want to do and why, then wait for their permission before cutting away clothing.

Assessment Ordering

Following the ABCDEs by rote may not always make sense. If your patient approaches you, and asks for help with a deep cut, it probably does not make sense to start by examining their airway and checking for a pulse. An unresponsive patient may have the order of the primary assessment changed depending on what the assumed injury or illness may be.

In a combat or other major trauma scenario, the priority will usually be checking for and controlling hemorrhaging. Excessive blood loss is itself a medical emergency, and if your patient requires CPR, blood loss will reduce its efficacy. Another mnemonic used in combat medicine is MARCH for massive hemorrhage, airway, respiration, circulation, and hypothermia. In a combat situation, or during a riot, evacuation may be delayed, and there may be risk of patient hypothermia, especially after cutting away clothing or otherwise exposing injuries. An unclothed, normothermic patient will neither gain nor lose heat in a room at 28 °C.[25] Thus, even on warm days, a partially clothed patient may become hypothermic, and care should be taken to prevent this.

Table 6.2: MARCH

M	Massive hemorrhage
A	Airway
R	Respiration
C	Circulation
H	Hypothermia

For all other cases, using ABC is generally the best approach. Note that patients who are not breathing may have a weak pulse and that time is better spent beginning basic life support than searching for a pulse.

Secondary Assessment

The primary assessment is to check for and manage immediate threats to a patient's life. Once it is complete, pause to reevaluate your situation. Is the scene still safe, or do you need to move the patient a short distance away from conflict? Are there other patients who may need more immediate care? There may be additional considerations like ensuring someone is able to watch for and redirect traffic or that someone has informed other medics that you are treating a patient.

The secondary assessment is a more thorough check of the patient's condition and medical history. If you are dealing with a single patient, consider having your buddy take notes about your measurements and other observations. If the patient's condition worsens or another medic takes over care of your patient, these notes will help them with their care and diagnosis.

Head-to-Toe Examination

The head-to-toe examination is exactly what it sounds like. It consists of examining your patient from their head to their toes checking for injuries and symptoms of serious medical conditions. You will look and feel for injuries, listen for unusual bodily noises, and smell for signs of disease.

During examination, remember that the human body has bilateral symmetry. To a large degree, the left and the right side of the body look the same. When checking a body part for injury, you can compare it to its opposite for signs of deformity. It is thus often useful, as long as you do not suspect spinal injury, to position them (or ask them to position themselves) comfortably on their back so you can readily access and compare both sides.

During the secondary assessment, it is recommend to explain to your patient what you are doing. This helps to humanize the process and will make the patient less nervous or uncomfortable. There is also research that suggests saying what you are doing aloud will help prevent you from making mistakes.[26] Stating what you are doing out loud will also help your buddy take notes and allow them to double check that you have not forgotten anything.

If your patient has recently been the victim of violence or assault, it is additionally recommended to re-check for consent each time before you touch them, especially before touching their head, neck, or torso. This helps your patient feel like they have regained control over the situation as well as autonomy over their own body. It may also help prevent retraumatizing them.

If you suspect your patient has a spinal injury, skip parts of the exam that require moving the patient. If you are able to perform a focused spine assessment and you have cleared your patient of suspected spinal injury, resume the secondary assessment and check areas that were previously unreachable. Chapter 15 ("Brain and Spinal Cord Injuries") explains how to perform a focused spine assessment.

Head and Neck

Check the mouth and neck for injuries or bleeding that may block the airway or cause pulmonary aspiration. Check the lips for cyanosis. This may indicate hypothermia or hypoxia.

Check the nose and ears for fluid, specifically cerebrospinal fluid (CSF). Palpate the skull and face for tenderness, depressions, and deformities. Run your fingers through their hair to check for obscured cuts and bleeding. Check the pupils' dilation, and ask if the patient has disturbances to their vision. Both are signs of brain injury. See Chapter 15 ("Brain and Spinal Cord Injuries") for more information on brain injuries.

Check the trachea for damage. Ensure it runs down the middle of the neck. A deviated trachea is a sign of a tension pneumothorax. See Chapter 16 ("Chest Injuries") for more information on pneumothoraces.

Check for distention of the jugular veins on either side of the neck. This may be a sign of shock or heart failure. See Chapter 14 ("Shock") for more information on shock.

Palpate the spine from the base of the skull to the shoulders, feeling for tenderness, muscle rigidity, and deformity. This may indicate injuries to the muscles, tendons, and ligaments, or it may indicate fractures.

Shoulders and Chest

Palpate the trapezius and shoulders for signs of rigidity. Palpate the entire clavicle (collarbone) for dislocation and fracture.

Check the chest for cuts and bleeding. Ask the patient to take deep breaths while you apply compression to the sides of the ribcage. This should not be painful. Check for signs of an open traumatic pneumothorax ("sucking chest wound"). While the patient breathes, look for bilateral symmetry in their chest movements. Asymmetric chest movements may be a sign of pneumothorax or flail chest. Further discussion of flail chest pneumothorax can be found in Chapter 16 ("Chest Injuries").

Abdomen

Divide the abdomen into four quadrants, with the belly button at the center. Lightly palpate the four quadrants with the palm of your hand, feeling for muscle rigidity, and asking the patient for any tenderness.

Look and feel for distension (outward expansion), bruising, swelling, and discoloration. This may be a sign of internal bleeding or hernia.

If the patient has a penis, check for priapism (erectness in absence of stimulation). This may be a sign of a spinal injury, brain injury, or drug intoxication.

Back

Check for bleeding and deformities. Palpate each vertebra for tenderness or deformities, an indication of spinal injury. Check the ribs and scapulae (shoulder blades) for fractures. Palpate the muscles and check for rigidity.

Arms and Legs

Check the arms from the shoulders to the hands and the legs from groin to feet, checking for signs of injury such as bleeding, tenderness, swelling, or muscle rigidity. Check the wrists for a medical ID bracelet.

You will need to check both hands and feet for circulation, sensation, and motion (CSM). Checking the CSM assess whether there is nerve damage at the extremity or spine and whether there is injury to blood vessels running to and from the extremity.

Table 6.3: CSM

C	Circulation
S	Sensation
M	Motion

In patients with suspected spinal damage, ensure you do not comment on a lack of motion. Doing so may cause the patient to attempt to look at their limb to see if it's moving or not. It may additionally distress them that their limb is not moving. Likewise, avoid testing for sensation if there is a lack of motion.

Circulation. To check for circulation in the arms and legs, check for the presence of the radial pulse and pedal pulse respectively. Additionally, check capillary refill time (CRT). This is done by elevating the hand or foot above the heart and pressing down on the lunula (fingernail bed) for 3 seconds. Measure how long it takes for reddish pink color to return to the lunula. Normal CRT is less than 2 seconds. Increased CRT can be a sign of shock, dehydration, decreased peripheral perfusion, or peripheral artery disease.

Sensation. To check for sensation, ask the patient if they have numbness, tingling, or itching, or if their extremity feels hot or cold. These abnormal sensations are called parethsia. Check sensitivity to touch by lightly touching their fingers and toes. To check the degree of sensitivity, have the patient look away and either scratch or lightly pinch a finger or toe. Ask them to identify the stimulus as scratching or pinching. Sensation checking should be done on the pinky finger and thumb of each hand and the little toe and big toe of each foot.

Motion. To check for motion, check for flexion and extension in the hands and feet. You may need to omit testing injured extremities. Check flexion in the hands by asking the patient to squeeze both your hands at the same time; doing them in parallel allows detection of reduced strength in one or the other. Check extension in the hands by placing your hands on the back of the patient's hands and asking them push against them by rotating their wrist so their knuckles move toward their forearm. To check flexion in the feet, put your hands against the bottom of the patient's feet and ask them to push against your hands. To check extension in the feet, place your hands on the tops of the patient's feet and ask them pull up. When checking flexion and extension, the patient should be able to apply a moderate amount of pressure. Weakness (paresis) or a lack motion (paralysis) indicates nerve or brain injury.

Vital Signs

Checking the patient's vital signs gives you measurements about their overall health. Checking the ABCs during the primary assessment will indicate if the patient is at immediate risk of death. During the secondary assessment, detailed measurements give clues to the underlying illness or injury as well as its progression. Measuring vital signs checks respiration, circulation, thermoregulation, and brain function.

Vital signs should be checked and recorded every 15 to 20 minutes. If you have a buddy who is stabilizing the head, they may be able to take vital signs while doing so; spine immobilization always takes priority, however. Patients with severe injuries or illnesses should be checked more often. Checking subsequent measurements against the initial measurements indicates whether the patient's condition is improving or worsening.

Level of Consciousness

Level of consciousness (LOC) is a measure of brain function and mental status. Brain function may be impaired for a number of reasons including swelling of the brain from trauma, inadequate oxygenation of the brain, the patient being too hot or cold, or low or high blood glucose among other causes.

To measure the LOC, medics use the simple classification system

AVPU for alert, responsive to verbal stimuli, responsive to painful stimuli, or unresponsive.

Table 6.4: Patient LOC

A	Alert
V	Responsive to verbal stimuli
P	Responsive to painful stimuli
U	Unresponsive

Alert. A patient is alert if they are fully awake or can be woken from sleep. They are classified as oriented times 0, 1, 2, 3, or 4 depending on whether they know who they are, where they are, the approximate time, and the events immediately preceding their injury or illness. Criteria for orientation are listed in Table 6.5.

Table 6.5: Patient Orientation

A+O×4	Patient knows name, place, time, and event
A+O×3	Patient knows name, place, and time but not event
A+O×2	Patient knows name and place but not time or event
A+O×1	Patient knows name but not place, time, or event
A+O×0	Patient does not know name, place, time, or event

In the context of riot medicine, you may not want to directly ask a patient's name since this is may violate their privacy and anonymity, especially if police or journalists are present. It is sufficient to ask "Do you know your name?"

When communicating these findings to other medical professionals, this is typically stated like "the patient is alert and oriented times four" or "the patient is alert and knows their name and place but not time or event."

Responsive to verbal stimulus. If your patient is not alert, they may still have enough higher brain function to respond to verbal stimulus. Say "Hello! Wake up!" If they do not respond, repeat this louder. The patient may not be able to verbally respond but may make a grunt or moan, open their eyes, or make movements in their limbs.

Responsive to painful stimulus. If your patient does not respond to verbal stimuli, you should attempt to elicit a response via a painful stimulus. There are two types of stimulus: central stimulus and peripheral stimulus. Response to a peripheral stimulus may be the result of reflex and not higher brain function. Conversely, they may elicit no response if there is nerve damage.

The painful stimulus should be done for 5 to 10 seconds with increasing force or until the patients responds. A response is a patient making a grunt or other noise, opening their eyes, or moving some part of their body.

Trapezius squeeze. The trapezius squeeze is a central stimulus. The trapezius is the muscle that connects the shoulder to the neck. Use your hand to apply pressure and twist the upper portion of the trapezius.

Mandibular pressure. Mandibular pressure is a central stimulus. The mandibular nerve is a nerve that runs along the mandible (lower jaw). Use your thumb to apply pressure just below the hinge of the jaw.

Supraorbital pressure. Supraorbital pressure is a central stimulus. The supraorbital nerve is the largest cranial nerve. It runs along the upper ridge of the eye socket. Use your thumb to apply pressure. Supraorbital pressure is not recommended if there is local trauma.

Nailbed pressure. Nailbed pressure is a peripheral stimulus. Apply pressure to the nailbed by gripping the patient's finger between your thumb and index finger. Use your thumbnail to press down on the lunula. If you cannot apply sufficient pressure with your hands, hold a pen in the palm of your hand, put the patient's finger between your middle and ring finger so that their fingernail is against the pen, make a fist, and use your fingertips to squeeze their nailbed against the pen.

Nailbed pressure is the easiest to apply quickly and successfully with the added advantage that it does not look like you are obviously trying to cause pain to the patient, something which may upset the patient's comrades or other bystanders.

As a note, the sternal rub is not recommended as a painful stimulus as it may cause bruising. If the patient has breasts, onlookers may not perceive it as a medical procedure.

Unresponsive. A patient is unresponsive if they do not respond to painful stimuli.

Cardiological Measurements

Abnormal heart rate, heart rhythm, and blood pressure can be strong indicators of different illnesses, especially shock. These vital signs can be measured via manual readings accurately enough for an initial diagnosis and treatment.

To measure heart rate, use the radial or carotid pulse. Using a watch as a timer, measure the pulse for 15 seconds then multiply the result by 4 to calculate the heart rate in beats per minute (BPM). Using shorter amount of time then multiplying by a larger factor does not give an accurate enough measurement. Normal resting heart rate is 60–100 BPM (beats per minute). A patient may have an elevated heart rate due to stress or recent exercise, both of which are likely during an action. A patient may have a lower resting heart rate if they are athletic.

If you have a pulse oximeter, clip to it to the patient's finger to measure both HR and peripheral oxygen saturation (SpO_2). SpO_2 is a measure of the percentage of oxygen saturated hemoglobin in the peripheral blood vessels. Finger clip pulse oximeters are accurate to within 2 percentage points of the actual value. For example, a reading of 97% may have a true value between 95 and 99%. A normal SpO_2 is 95–99%. Patients with SpO_2 below 95% should be monitored. A reading below 90% accompanied by any signs of cognitive impairment or cyanosis is grounds for evacuation to advanced medical care.

If the patient has nail polish or acrylic nails, the SpO_2 reading may be lower than their actual SpO_2.[ii] To prevent incorrect readings, rotate the pulse oximeter 90° around the patient's finger. SpO_2 measurement is covered in more detail later in this chapter.

While you are checking the heart rate, also feel if the pulse is irregular. If you are measuring heart rate with a pulse oximeter, depending on the model, you may need to do this manually.

Take note of whether or not the pulse feels strong or weak. If you have a sphygmomanometer (blood pressure meter) and stethoscope, use these for an accurate reading of blood pressure.

Systolic blood pressure (SBP) is the maximum blood pressure during one heartbeat. Diastolic blood pressure (DBP) is the minimum blood pressure between two heartbeats. Blood pressure is measured in millimeters of mercury (mmHg) of pressure above the current atmospheric pressure.

Table 6.6: Reference Ranges for Blood Pressure

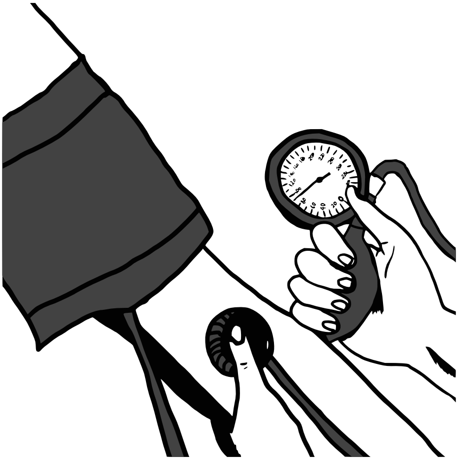
Category	**Systolic BP**	**Diastolic BP**
Optimal	< 120	< 80
Normal	120–129	80–84
High Normal	130–139	85–89
Hypertension	≥ 140	≥ 90

[ii] Some studies suggest that modern pulse oximeters are not affected by dark nail polish or acrylic nails. To err on the side of caution, for patients with painted or fake nails, you should always clip the pulse oximeter rotated away from their fingernail.

Systolic blood pressure below 90mmHg or that falls approximately 40mmHg below the patient's baseline may indicate shock. See Chapter 14 ("Shock") for more information about shock.

Using a sphygmomanometer. Measuring blood pressure is done by occluding blood flow through an artery, typically the brachial artery, using a pressurized cuff and then listening for the sounds of turbulence in the blood flow (Korotkov sounds) using a stethoscope or using a digital oscillometer.

Figure 6.4: Measuring Blood Pressure[24]



If you place your stethoscope over the brachial artery in the cubital fossa (the triangular region of the inside of the elbow) of a patient without arterial disease, you will not hear any sounds. Blood flowing through arteries and veins has a laminar (non-turbulent) flow. By occluding blood flow with a cuff and then releasing it, during the peak pressure during a systole, some blood will turbulently rush through the vein. This turbulence produces a sound. As the pressure drops, eventually the pressure in the cuff will be below that of the diastolic blood pressure, and the blood flow will again become laminar. Sounds will no longer be audible. The pressure displayed on the gauge when the Korotkov sounds begin and end are respectively the systolic and diastolic blood pressures.

Figure 6.4 shows proper placement for the cuff and stethoscope diaphragm. To measure blood pressure with a manual sphygmomanometer, use the following steps:

1. Remove bulky clothing from the patient's arm.
2. Place the cuff over the upper arm and tighten it until it is snug.
3. Using one hand, find their radial pulse.
4. Using your other hand, use the sphygmomanometer's bulb to rapidly inflate the cuff until the pulse disappears, then give one additional pump.
5. Place the diaphragm of your stethoscope on the cubital fossa.
6. Slowly release air from cuff at a rate of approximately 3mmHg per second.
7. Listen for the presence of the Korotkov sounds; the reading on the dial at this time is the systolic blood pressure.
8. Listen for the absence of the Korotkov sounds; the reading on the dial at this time is the diastolic blood pressure.

In a loud environment, you may not be able to hear the Korotkov sounds. Instead of using a stethoscope, use your fingers to feel the radial pulse. When releasing pressure from the cuff, the reading on the dial when you feel return of the patient's pulse is the systolic blood pressure.

To measure blood pressure with a digital sphygmomanometer, the exact procedures may vary. Generally, you will apply the cuff using the same procedures for a manual sphygmomanometer, and then simply press the start button. After several seconds, the device will display systolic and diastolic blood pressure as well as heart rate.

The cuff sizes for sphygmomanometers will vary, and if the inflatable part of the cuff does not cover at least 80% of the circumference of the arm, you will have inaccurate readings. Since you will not be able to bring multiple cuffs, a standard adult size will suffice in most situations.

Respiratory Measurements

When measuring the respiratory system, the respiratory rate needs to be measured along with the quality of respiration such as apparent effort, depth, noises, and odor.

To measure the respiratory rate (RR), count the number of respirations over 30 seconds a multiply the value by 2. One respiration is one complete inhalation and exhalation, or simply one rise and fall of the chest or belly. The normal human respiratory rate is 12 to 20 breaths per minute.

Normal breathing should be relatively quiet and done with ease, and the breath should be mostly odorless. Irregular breaths may be a sign of brain injury. Shallow, rapid, painful breaths may be a sign of chest injury. Deep, labored breaths are a sign of respiratory distress and may be associated with pneumothorax, pulmonary embolism, asthma, or hyperventilation. Breath that smells fruity of acetone is a sign of hyperglycemia. Noisy breathing indicates an obstructed or damaged airway.

Skin Signs

Examining the skin gives insight into the overall quality of the circulatory and respiratory systems. Check the skin color, temperature, and moisture (SCTM). Under normal conditions, skin is pink, warm, and relatively dry. To assess the pinkness of skin in darker skinned patients, check the fingernail beds, palms of the hands, soles of the feet, gums, or inside of the lips. The pinkness of skin is an indication of adequate blood flow and oxygenation. Blood with high oxygen saturation appears redder, and blood with low oxygen saturation appears bluer.

Table 6.7: SCTM

SC	Skin Color
T	Temperature
M	Moisture

Human skin naturally has great degrees of variation in color and even among patients with apparently similar skin color, there are different undertones (e.g., a person with “white” skin may have red or olive undertones). When you are examining skin color, you are not taking an absolute measurement, especially when looking for paleness (pallor) or redness (erythema). You need to compare their current color against the their baseline color. If this is difficult to asses, you may choose to hold up a small mirror so the patient can see their face and ask “Is this your normal skin color?”

Cyanosis is the bluish or purplish discoloration of the skin, generally first seen around the lips or on the nailbeds, due to decreased oxygen saturation in the tissue near the surface. Cyanosis indicates decreased SpO_2. This may indicate decreased cardiac output, arterial obstruction, hypoxia, hypothermia, or drug overdose.

When the skin is flush with blood, it takes on a reddish hue. This may be due to something innocuous like physical exertion or a warm day. Skin may be reddish due to burns, fever, allergic reaction, or heat stroke.

The skin may become pale, gray, or ashen as blood withdraws from the surface. This is known as pallor. This could simply be a result of fear, acute stress, the cooling of the skin, shock, or syncope (fainting).

The temperature together with the moisture of the skin will indicate several possible illnesses. Cool, moist skin is a sign of shock. Hot, dry skin is a sign of heat stroke. Hot sweaty skin may be a result of physical exertion, fever, or minor heat illness.

Pupils

Examination of the pupils can indicate possible brain dysfunction such as brain trauma, hypoxia, drug use, or stroke. Under normal conditions, humans have equal sized pupils that dilate in dim light and contract in bright light. To test pupil dilation, shine a light into the patient's eyes and check for a reaction. If you are outside during the day, you may need to shade the patients eyes then move the shade away instead of using a penlight.

If both pupils are small and pinpoint (miosis), the patient may be under the effects of opioids. If both pupils are dilated (mydriasis), the patient may be under the influence of amphetamines or cocaine. Pupils of uneven size (anisocoria) indicates a brain injury on the side of the brain with the larger or unreactive pupil. Pupils that react to light, but slowly, may indicate a lack of oxygen in the brain. See Figure 6.5 for examples of pupil dilation.

Medical History

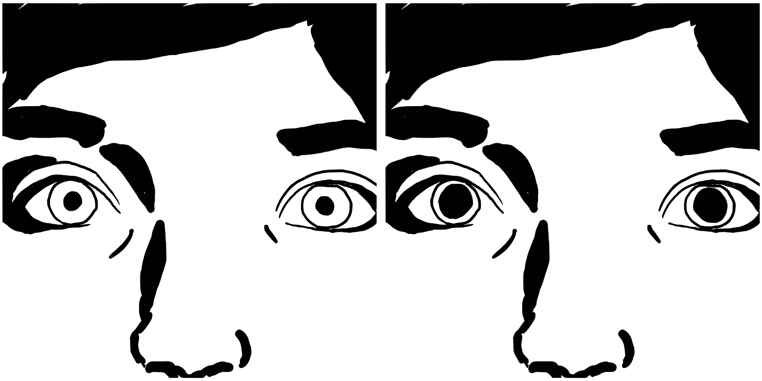
In addition to examining the patient's body, you need to conduct an interview with the patient about the nature of their injury or illness as well as their relevant medical history. As it was noted at the beginning of this chapter, not all steps of the patient assessment need to be followed for all patients. Patients with minor trauma at an action may simply be given an ice-pack and sent on their way. Whether or not to conduct a more in-depth patient interview depends on your subjective assessment of the patient and whether or not gathering more information is necessary to treat them.

SAMPLE History

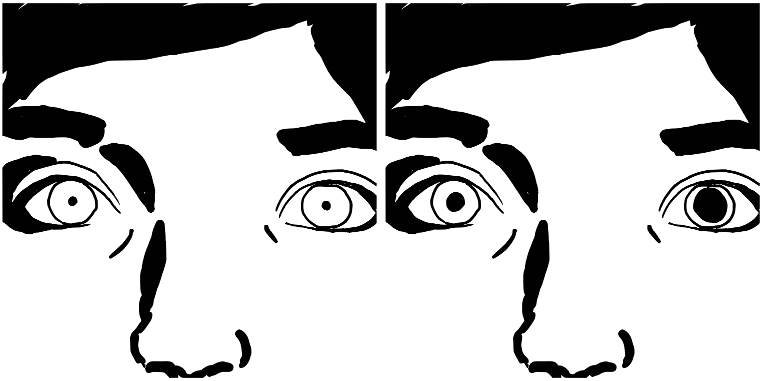
You will need to interview the patient's about their relevant medical history. A mnemonic to help you remember all the topics that you should cover is SAMPLE for signs/symptoms, allergies, medications, past history, last oral intake, and events.

Signs and symptoms. What are the signs and symptoms of their illness or injury? Are they experiencing pain, fatigue, or nausea? To help you determine this, use the OPQRST mnemonic discussed later in this chapter.

Figure 6.5: Pupil Dilation[24]



(a) Normal (b) Dilated



(c) Pinpoint (d) Uneven

Table 6.8: Medical History Assessment

S	Signs and symptoms
A	Allergies
M	Medications
P	Past medical history
L	Last oral intake
E	Events leading to incident

Allergies. Does the patient have allergies to any food, medications, pollen, plants, animals, or other wildlife? Is it possible they were recently exposed to one of their allergens? What are their typical symptoms to exposure? What is their typical treatment for exposure to their allergens? Do they take medication or have an epinephrine autoinjector?

Medications. Is the patient currently taking any medication? What is this medication for? Have they taken their medication today? Do they have medication with them? Ask the patient about medication they take regularly and irregularly including prescription, non-prescription, herbal, and birth control medication. Ask the patient if they take or have recently taken recreational drugs, or have recently drunk alcohol.

Past history. Ask the patient about their relevant medical history. Do they have any congenital conditions? Are they currently seeing a physician for any injuries or illnesses? If so, for what? Have they been admitted to an emergency room recently? Have they had surgery recently? If the patient has an illness, do they have a history of similar illnesses? A patient may have a medical necklace, bracelet, other tag, or card in their wallet that explains their medical concerns, and you may need to check for this if the patient is unable to answer your questions.

Last oral intake. Has the patient eaten or drank anything recently? How much have they eaten or drank over the course of the whole day? At demonstrations, patients often have not eaten enough and are dehydrated. These questions are especially relevant for diabetic patients.

Events. Ask the patient for recent events during the past day or week that may have contributed to their injury or illness.

Chief complaint

You may need to interview the patient about the reason they have sought your help, especially in cases where the injury, illness, or its cause is not readily apparent. The patient's subjective assessment of their injury or illness and your diagnosis are collectively known as their chief complaint (CC) in the United States and as their presenting complaint (PC) in the EU and Canada. A useful mnemonic for interviewing the patient about their chief complaint is OPQRST for onset, provokes/palliates, quality, region/radiation, severity, and time.

Onset. How did the chief complaint develop? What was the patient doing during the onset of their CC, and do they believe the activity is linked to their CC? Were they active, inactive, or experiencing stress at this time? Was the onset slow or gradual? Is the onset related to a chronic condition?

Provokes/palliates. Does the patient believe there is anything that

Table 6.9: Chief Complaint Assessment

O	Onset
P	Provokes/palliates
Q	Quality
R	Region/radiation
S	Severity
T	Time

makes the CC better or worse such as movements, positions, palpation, or other external factors?

Quality. What is the quality of their CC? Is there pain, and is it sharp, dull, crushing, or stabbing? Is there burning or tingling?

Region/radiation. Where is the patient's pain located? Is it localized to a single body part or does it seem to radiate away from the epicenter to other parts of the body?

Severity. How severe is the patient's pain? This may be measured on a scale of 1 to 10.

Time. How long has the patient been experiencing symptoms? Has the quality or severity of their symptoms changed over time? Are the symptoms still present? Do they disappear and then reappear?

Diagnosis and Treatment

Once you have examined and interviewed your patient, you will need to make a diagnosis so that you may begin treating the underlying causes. This may be made as a snap decision. For example, if a patient comes up to you with a bleeding hand, you probably do not need to interview them about the quality of their pain or their medical history. The treatment you give may range from fully bandaging a wound or decontaminating them from riot control agent to simply monitoring their vitals until they can be evacuated by an ambulance. More information on evacuation guidelines can be found in Chapter 7 ("Patient Evacuation").

Restoring Dignity

Your job as a medic is not simply to treat injuries but also to provide emotional care for your patient. In this book, the term patient is used for succinctness when describing a person who has been injured or fallen ill, but it is crucial to remember that patients are humans, complex beings with fears, hopes, anxieties, and dreams. The people you treat have lives that began before your contact with them, and these lives will go on long after you have finished assisting them. During high stress situations with multiple patients, it can be easy to see a patient as simply the sum of their injuries. They may appear to just be “Head Injury” or “Pepper Spray Face” to you.

Slow down, take a deep breath, and remind yourself that you are caring for a person. Your calmness and compassion will help them relax and makes for a more pleasant treatment experience. This is especially important as they may be traumatized, and these are key components of psychological first aid. Additional information on psychological first aid can be found in Chapter 8 (“Psychological Care”).

Discharging Your Patient

After you have treated your patient to the extent of your abilities, you should include aftercare steps for their injury or a recommendation to see a medical professional. Patients may be reluctant to go to a hospital because this may increase their chance of arrest.[iii] You should clearly communicate any risks associated with their illness or injury if they do not seek additional care. If you think they should seek additional care, clearly state that this is the case. Do not be afraid to make statements like “Your injury is outside the scope of my knowledge, and I cannot give reliable medical advice about this. You should see a doctor.”

Failure to discharge your patient or transfer care to another provider may run afoul of an ethical (and legal) concept called patient abandonment. In the context of riot medicine, patient abandonment occurs when a medic stops treating a patient who has not been transferred to another caregiver while they are still in need of emergency care. Patient abandonment occurs when there is negligence on behalf of the caregiver, but the caregiver may terminate care for valid reasons such as:

- The scene becomes unsafe for the medic
- The patient assaults or harasses the medic
- The medic is incapable of providing the care the patient needs
- Ethical or legal problems would arise as a result of further treatment

Even if you cannot provide care for your patient, if they are having a medical emergency, you should stay with them until a more qualified provider arrives.

[iii] In some regions, law enforcement checks hospitals after actions to find participants to arrest.

Additionally, it is not patient abandonment if the medic needs to temporarily attend to another patient when there are multiple injuries so long as the medic returns to the original patient. An additional caveat is that some regions have laws stating that if you begin CPR or artificial ventilation, you are legally compelled to continue until relieved by more advanced medical personnel.

You should research what constitutes patient abandonment in your region to understand when and how you may terminate care and when you are required to continue providing care.

Calling EMS

There are a number of conditions that should immediately trigger calling emergency medical services (EMS). Some of these conditions are:

- Loss of consciousness
- Difficulty breathing
- Respiratory or cardiac arrest
- Suspected poisoning or overdose
- Massive hemorrhage
- Cardiac chest pain
- Anything your instinct suggests is “very bad”

In order to keep your hands free and to allow you to concentrate on treating the patient, have your buddy call EMS. If your buddy is helping, or you have no buddy, assign someone to call EMS. Do not make a general statement like “Someone call 9-1-1” as no one may make the call due to the bystander effect and the diffusion of responsibility. Instead, single out someone from the crowd and call out to them based off an obvious feature. Say “You, with the red shirt. I need you to call 9-1-1.” Direct them to come to you so you can ensure they are following through with your instructions and so that you can answer questions the dispatcher may have.

If no one is able to help, put your phone on speakerphone, turn the volume all the way up, and place it next to you. Talk to the dispatcher while you work.

When talking to a dispatcher, remember to speak slowly, to be concise, and to give the most relevant information first. If the call is cut off, the dispatcher may still be able to send an ambulance to you. Information should be given in the following order.

Nature of the emergency. In one short sentence, state the reason why you are calling EMS. This may be “I have an unconscious patient” or “There are multiple casualties following a building collapse.”

Location. Give your exact location. This may be a cross street, address, or position relative to a landmark.

Callback number. Give the dispatcher your mobile phone number, possibly including the country code so that they may call you back if the call is disconnected.

Your qualifications. State that you are a medic. This will alert the dispatcher that you are a competent practitioner. They will be able to ask you more in depth questions or may be able to guide your treatment.

Details on the patients. Give relevant details on the patients and their injuries that may allow the dispatcher to send the appropriate resources or to prioritize your patients against other incidents.

Do not hang up. Do not hang up until directed to do so. The dispatcher may instruct you to stay on the call until an ambulance arrives in order to help guide them to you. They may additionally be able to connect you to someone who can help guide your treatment.

Expect police. By calling EMS, even if you dial a dedicated or non-emergency number, police may still arrive before or after the ambulance. It may be necessary to call EMS for the patient’s health, but you should nonetheless warn them and others about this possibility so that the patient can decide if this is what they want or not. You may also want to encourage rioters or those who may be incriminated while present to leave for their own safety.

Triage

A mass casualty incident (MCI) is any incident where the quantity and severity of injuries exceeds the current medical resources. For example, the collapse of a small building might not be classified as an MCI if the local EMS and emergency departments of hospitals can handle all the patients. Conversely, and in the context of riot medicine, three patients with minor trauma might qualify as an MCI if there is only one inexperienced medic present.

Triage is the process of prioritizing patients for care based on the severity of their injuries. As a medic, most cases where you have to triage patients will be for minor injuries and riot control agent contaminations, and as such you will be able to eventually handle all patients. Protesters who have never been injured by riot police or in a street fight may be the most frantic or flustered, so using a patient's own assessment of the severity of their injuries may not be the best way to prioritize care.

When dealing with an MCI, you should keep all patients in one area so that you may monitor everyone simultaneously. This additionally makes you as a medic easier to find and serves as a rally point for further injured patients. Enlist the help of uninjured bystanders to collect patients. If someone tells you that their comrade is injured and needs help, tell them to bring their comrade to you. If they indicate that the injury is serious enough to require more immediate attention, and there are no patients present who require your immediate attention, go with them.

For MCIs with more serious injuries, you will need to quickly make the decision whether handling all the patients is beyond your capacity and if any of the injuries may be life-threatening enough to warrant additional help from traditional EMS. When triaging patients, you should avoid over-triaging patients as untreatable as additional medical help will likely arrive quickly, and you likely will not have the experience necessary to determine whether injuries are survivable or not. These patients will benefit significantly from any care you give, and you may be able to provide enough care that advanced medical personnel can save them. For example, if all patients have minor injuries except one patient who is not breathing, you should not classify them as dead but should attempt to resuscitate them.

If there are many medics present, one should act as an incident commander. Their responsibility is to direct resources, track classifications, and maintain an overview of the situation. They may need to ensure that medics continue to triage patients instead of stopping at the first person who comes to their attention. The incident commander is not necessarily the most medically qualified, but the person who is most apt to handle an MCI with many patients. This may mean an uncertified but experienced riot medic manages higher qualified medics. Medics with high medical qualifications are better suited for treating patients, and these medics may only have clinical experience and be unable to manage the chaos of a riot. Once all patients have been assessed and classified, it may make sense for the incident commander to assist with treatment rather than remain in a supervisory role.

SALT Triage Algorithm

The SALT triage algorithm (Figure 6.6) is common in the United States and may be applicable in your region. SALT stands for sort, assess, lifesaving interventions, and triage/treatment. Protocols for triage and classification of patients vary from region to region. You should research how your local EMS triages patients so that you may effectively interface with them. The SALT algorithm places patients into five categories, listed in Table 6.10 from least severe to most severe. Note that in some regions, the color black is used for both expectant and dead patients.

Table 6.10: SALT Triage Categories

Category	Color	Description
Minimal	Green	Patient requires minimal aid, if any
Delayed	Yellow	Patient requires medical attention within 6 hours
Immediate	Red	Patient requires immediate medical attention to survive
Expectant	Blue	Patient is expected to die regardless of intervention
Dead	Black	Patient is dead

Sort

The first step is sort the patients into three groups determine who needs to be assessed first. Ask all patients to walk to you for assessment. Patients who are ambulatory are assessed last. Ask all non-ambulatory patients to wave at you. Patients who can wave or make other obvious movements are assessed second. Patients who cannot respond to verbal commands or who have obvious life-threatening injuries (such as massive hemorrhage) are assessed first. Thus, the ordering for assessment is:

1. Unresponsive or critically injured
2. Responsive but non-ambulatory
3. Responsive and ambulatory

Patients who are ambulatory may still be critically injured, and patients who do not respond may fail to do so simply due to hearing damage. All patients need to be assessed.

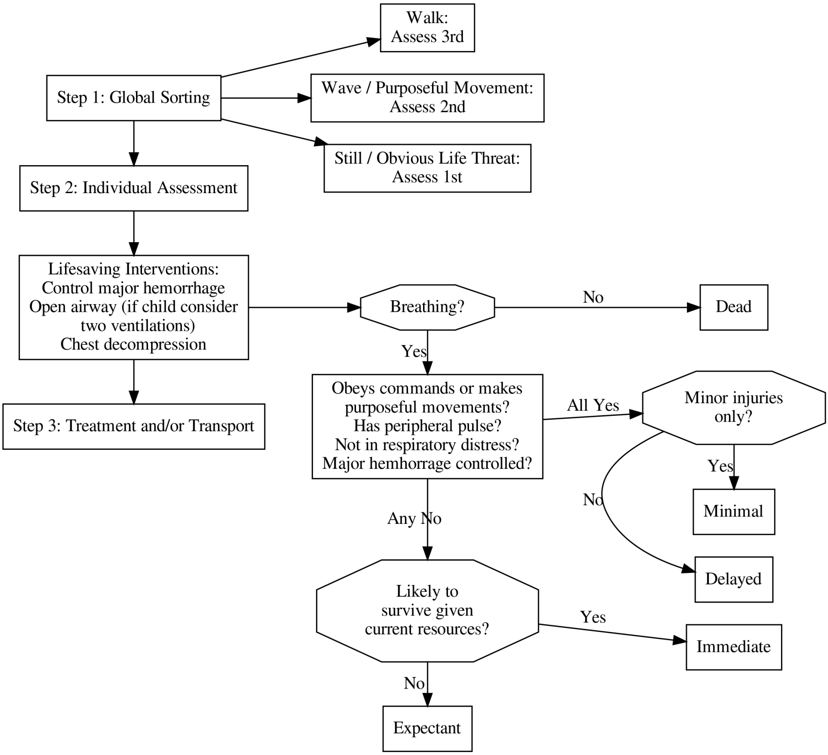
Assess and Lifesaving Interventions

Assessment and lifesaving interventions are done simultaneously, should take under 1 minute, and should only use quick manual checks. Do not use diagnostic equipment such as a pulse oximeter or sphygmomanometer.

If there is major hemorrhage, control it with a tourniquet. Early use of tourniquets is associated with improved survival rates with minimal risk.[28–30] Tourniquet use is covered in Chapter 12 (“Wound Management”).

Open the patient’s airway. If the patient is not breathing and is a child, consider giving two ventilations. If the patient has anaphylaxis,

Figure 6.6: SALT Triage Algorithm[27]


Walk:
Assess 3rd
Step 1: Global Sorting
Wave / Purposeful Movement:
Assess 2nd
Still / Obvious Life Threat:
Assess 1st
Step 2: Individual Assessment
Lifesaving Interventions:
Control major hemorrhage
Open airway (if child consider two ventilations)
Chest decompression
Breathing?
No
Dead
Yes
Step 3: Treatment and/or Transport
Obeys commands or makes purposeful movements?
Has peripheral pulse?
Not in respiratory distress?
Major hemhorrage controlled?
All Yes
Minor injuries only?
Yes
Minimal
No
Delayed
Any No
Likely to survive given current resources?
Yes
Immediate
No
Expectant

consider giving them an epinephrine injection as discussed in Chapter 24 ("Allergies and Anaphylaxis").

Assessments and interventions must be done quickly. One critically injured patient who requires significant time or attention will divert resources away from other patients. The reality of triage is that it is optimized for saving the largest number of lives at the expense of the most critically injured.

Triage and Treatment

During your assessment, you should classify patients as follows.

If the patient is not breathing, they are classified as dead. Roll them into the rescue position to increase their chances of survival in the event that they spontaneously begin breathing.

Perform the following checks to determine the criticality of the patient's injuries:

1. After the 1 minute assessment, have their major hemorrhages been controlled?
2. Do they have a peripheral pulse (radial pulse)?
3. Are they not in respiratory distress?
4. Can they follow commands or make purposeful movements?

If the answer to any of the above questions is no, the patient is classified as immediate. If the patient is unlikely to survive given current resources, they are classified as expectant. As stated before, medics should avoid use of the expectant category as additional resources will typically rapidly arrive and there are few cases where multiple individuals will have immediately life-threatening injuries.

If the answer to all of the above questions is yes and the patient has serious injuries that will require treatment by advanced medical care, they are classified as delayed. This includes long bone fractures and burns. All other patients are classified as minimal.

Once patients have been classified, move on to treatment. Triage categories are not definitive classifications, and patients may need to be reclassified as their conditions deteriorate or improve. The incident commander should keep watch to ensure all patients receive aid and whether any require immediate treatment.

Summary

When you have a potential patient, ensure the scene is safe, approach them, and obtain consent to treat them. Do an initial assessment and check their vitals using ABCDE, and if needed begin basic life support. Consider conducting a secondary assessment with a head-to-toe examination looking for signs of injury. Measure the patient's vital signs including level of consciousness using AVPU. Check their heart rate, respiratory rate, blood pressure, limb function using CSM, skin signs using SCTM, and pupils. See Table 6.11 for a quick reference of normal values. Consider interviewing your patient using SAMPLE. Ask questions about their chief complaint using OPQRST. Make a diagnosis and begin treatment, considering whether or not they need to be evacuated to advanced medical care. The patient may have multiple injuries or illnesses, so remember to start by treating what kills the patient first. All the while, help calm your patient and do what you can to restore their dignity.

Table 6.11: Normal Vital Signs

Measurement	**Value**
Heart rate	60–100 BPM
Respiratory rate	12–20 breaths per minute
Blood pressure (systolic)	90–140 mmHg
Blood pressure (diastolic)	80–95 mmHg
Blood glucose	4.4–10 mmol/L (80–180 mg/dL)
SpO_2	95–99%
Capillary refill time	< 2 seconds

7 : Patient Evacuation

> Practice mutual aid! That is the surest means for giving to each and to all the greatest safety, the best guarantee of existence and progress, bodily, intellectual, and moral.
>
> Pyotr Kropotkin, *Mutual Aid: A Factor of Evolution*[31]

Patient evacuation is the general term used for moving a patient from somewhere dangerous to somewhere they can receive care. This may mean moving them away from central conflict where medics can quickly treat them, or it may mean a more complicated situation of transporting a seriously wounded comrade to advanced medical care. The nature of an evacuation depends on the patient's injury or illness, the tactical situation, and what advanced medical care is available.

Throughout this book the phrase "advanced medical care" is used to describe care that can be provided by more qualified medical personnel, typically at a facility designated for caring for the ill and injured. In the west, in everyday circumstances, this care would mean calling an ambulance that may or may not take the patient to a hospital. Medics may not have ambulances available, and hospitals may be monitored by police, so sending a protester to a hospital can lead to their arrest. Doctors, nurses, and EMTs sometimes volunteer their time to create makeshift clinics near actions using comrades' homes or social centers as an alternative to traditional medical care. Such field hospitals are also used in regions where healthcare is prohibitively expensive or where police repression can lead to arrest after treatment in a traditional hospital. Thus, an evacuation to advanced medical care might mean calling an ambulance or it could be getting a patient into a car and driving them to a field hospital. To allow medics to make these decisions on their own, the general terms are used throughout this book.

Further, the term "definitive care" is used to mean a place where a patient will receive complete care for their injuries or illness. Definitive care implies safety from police and other fascists and enough calm that the patient can relax. This typically means advanced medical care, but for minor injuries or when advanced medical care is not available, definitive care might mean treatment in the back of a sympathetic cafe.

The first step of evacuation is moving the patient. Patients may be able to assist with their evacuation, or they may be fully incapacitated. A medic may have to move a patient alone, or there may be others around to assist. Stretchers are rarely available as most medics do not pack a carry tarp, and improvising one may be difficult and time consuming.[i] The primary means of patient evacuation are various carries.

Evacuation Guidelines

The following are guidelines that are generally applicable for patient evacuations. However, you may find the following does not apply in your region to you due to the nature of emergency medical services or police repression.

Plan for evacuation. Before an action begins, it should be known what traditional and nontraditional medical resources are available. The safety of traditional hospitals should be known so that medics can inform patients, and the patients can give informed consent to their evacuation. For field hospitals, their locations and the contact information for their operators should be known as should the safest routes from an action to these facilities. The level of care offered by field hospitals should also be known so that medics can decide if it is appropriate to send patients there. Life threatening injuries and illnesses should always be sent to hospitals unless the patient does not consent. An arrested protester is better than a dead protester.

Only evacuate when necessary. Unless the scene is unsafe, it may be more suitable to leave the patient in place for initial treatment. This is especially true of suspected spinal injuries.

Obtain patient consent. Patients should consent to evacuation before they are evacuated. Implied consent allows you to evacuate patients who are not alert, but you should still listen a patient's requests or requests from their comrades. Patients may not want an ambulance or to go to a hospital, or they may not want to leave an action. These decisions should be respected, but that does not mean you should not clearly articulate the risks of forgoing advanced medical care.

Communicate during evacuation. Before attempting to evacuate a patient, all medics and volunteers who are assisting with the evacuation should know the evacuation route. The situation may change, and improvisation may need to occur, but it is easier to sort out details before starting an evacuation. Naturally, there are times where no plans can be made such as when a patient is in crossfire between protesters and riot cops.

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[i] Luckily, it is relatively uncommon to both need to evacuate a patient via stretcher and to have no access to ambulances.

Lift together. If multiple medics are involved in carrying the patient, one medic should be the leader who coordinates lifting and lowering the patient. The medic should say something similar to "Lift on three. One, two, three." This prevents anyone from lifting before of after everyone else, preventing injury to medics or the patient.

Lift with your legs. When lifting a patient, squat low and keep your back in a straight line. Lift using your legs. Do not lock your knees and lift using only your lower back. This is less stable, and you may injure yourself.

Move slowly. Moving quickly may save a few seconds, but the increased risk of dropping the patient is not worth it. Lifting and lowering a patient should be done with slow, controlled movements. Walking at a brisk pace is generally the fastest medics should transport a patient.

Less is more. People like to help with evacuations because it makes them feel useful. Generally, two medics are all that is necessary to carry a patient without a stretcher. Untrained volunteers may be able to help with the weight, but they often get in the way and trip over each other. Medics do not need much strength or fitness to carry patients short distances, which is often all that is necessary.

Ambulances. If an ambulance was called, it may be difficult for them to find or reach you. Unless there is immediate risk to the patient, it is generally better to leave the patient where you are treating them than to move them to the ambulance. Send a medic or volunteer to rendezvous with the ambulance and guide the EMTs to the patient. Do not abandon the patient to find the ambulance.

Helicopters. If patients are being evacuated by helicopter, stay back from the landing zone until signaled by the crew to approach. Dust that is kicked up can temporarily blind you. Rotors are hard to see and can kill you. Do not approach the helicopter from high ground or from the rear. Crouch low while approaching.

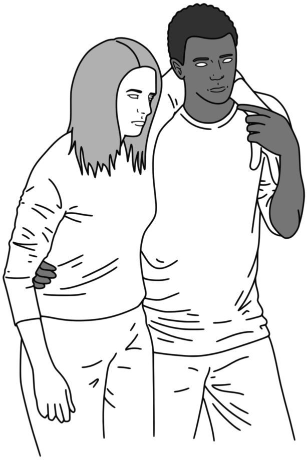
Carries and Drags

Most evacuations can be accomplished by one of the following carries or drags. Contraindications for these are suspected spinal injuries as none of these protect the spine.

Walking Assist

A walking assist (Figure 7.1) is used with patients who have enough strength and coordination to support their own weight and assist with their evacuation. Examples are patients with a sprained ankle, patients who have been pepper sprayed, or patients who are dazed or intoxicated. Contraindications for a walking assist are injuries to the patient's arm, shoulder, or ribcage. This carry can be modified to use two medics with one on each side.

Figure 7.1: Walking Assist[12]



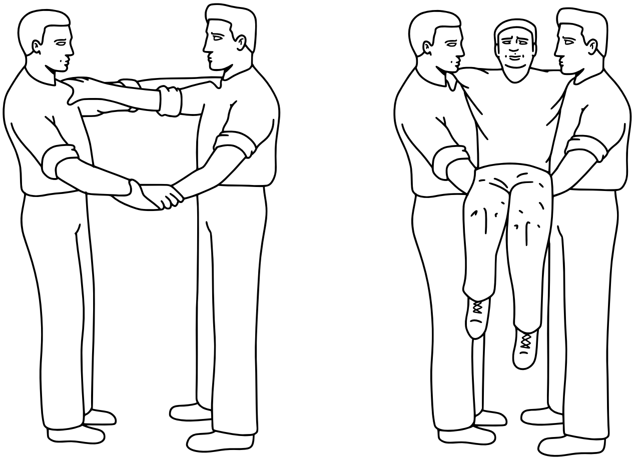
To perform a walking assist, stand beside the patient. Place their arm over your shoulder and grasp their wrist with your hand. Place your other arm around their waist.

The walking assist is often used to scoop up patients who have been pepper sprayed and cannot see. When performing this on a patient who is blinded, announce that you are a medic who is going to help them to safety before touching them. It is typically enough to say "I'm a medic. Let's go!" If a patient thinks you are a cop, they may recoil, trip, and hurt themself, or they may strike at you.

Two-Person Carry

A two-person carry (Figure 7.2) is used with patients who cannot walk on their own but are alert enough to keep balance. Contraindications are injuries to the patient's arms and shoulders that prevent them from helping support themself. While it is possible to use this carry with an unconscious patient, other carries are preferred.

Figure 7.2: Two-Person Carry[12]



To perform a two-person carry, two medics face each other. They extend one arm onto to each other's shoulder to create a back support. Using their other arms, they grasp one another's wrists to create a seat. If it is difficult for the medics to grasp each other's wrists (possibly because of sweat or bulky clothing), a loop of cloth (such as a gaiter) or a belt can be used to create a "seat" that both medics grasp. The medics squat low while the patient leans back into the medics' arms. The patient places their arms over the medics' shoulders. This is necessary to prevent the patient from falling forward while being carried.

Rautek Maneuver

The Rautek maneuver[ii] (Figure 7.3) can be used by a single medic. Most medics can perform this alone on patients who are far heavier than them to move a patient tens of meters. This is the most complicated of the carries and drags, but it is the safest and most stable. Contraindications are injuries to the arm and shoulder.

In this example, it is assumed that the medic is right hand dominant and that the patient has an uninjured right arm and shoulder. To perform

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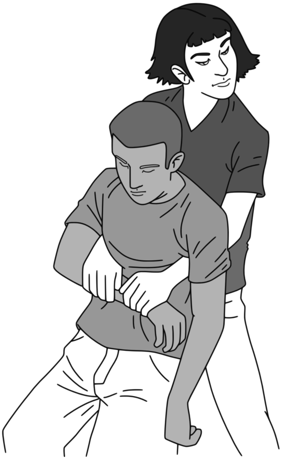
[ii] The Rautek maneuver (German: *Rautek-Rettungsgriff*) is named after its inventor, Franz Rautek, an Austrian martial arts instructor.[32]

Figure 7.3: Rautek Maneuver[12]



the Rautek maneuver, use the following steps:

1. Roll the patient on to their back.
2. Kneel behind the patient's head.
3. Lift the patient's head into your lap and scoot your knees under their shoulders.
4. Push the patient up into a sitting position so that their shoulders are supported by your chest.
5. Cross their right arm over their chest.
6. Using your left arm, reach under their left arm and grasp their right wrist.
7. Using your right arm, reach under their right arm and grasp their right forearm.
8. Lift their torso off the ground and walk backwards so that their feet drag.

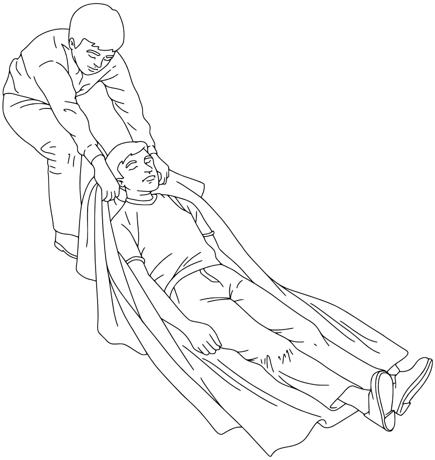
When you have reached your destination, perform the steps backwards so that the patient's torso is slowly lowered on to the ground. Take care to ensure their head does not hit the ground as you lower them.

This maneuver can be modified into a carry with assistance from a second medic. The second medic lifts the patient's feet while the first medic lifts the patient's torso. This maneuver can also be modified by grasping your hands together in front of the patient instead of using their arm as a support.

Blanket Drag

The blanket drag (Figure 7.4) is the least complex for a single medic to use on a heavy patient. Of the carries and drags, it is also the least harmful for a patient with a suspected spinal injury. However, use of a stretcher is preferred, and waiting for an ambulance is ideal.

Figure 7.4: Blanket Drag[12]



To perform a blanket drag, place the patient on their back next to on a blanket, tarp, or canvas banner. Roll them into the rescue position, slide the blanket up against them, then roll them back on to it. The blanket should extend above their head to provide support. Grasp the corners of the blanket above the patient's head using both hands. Drag the patient while walking backwards. When you have reached your destination, lower the blanket gently to avoid hitting the patient's head against the ground.

If a blanket is not available, this drag can be modified by grasping the clothing on the patient's shoulder and using your wrists to provide support for the patient's head. However, the Rautek maneuver is preferred.

Stretchers

Medics who wish to evacuate patients via a stretcher would ideally use a carry tarp.[iii] However, these are may be too heavy and large for your medic bag. Stretchers can be improvised using materials available at an action.

Stretcher Usage

Generally, only two medics are required to carry a patient on a stretcher, though their shape allows four to six medics to assist in carrying a patient. Regardless of the stretcher used, several medics are needed to get a patient onto a stretcher.

Patients should be rolled onto their side as described in Chapter 15 ("Brain and Spinal Cord Injuries"). Once they are on their side, a stretcher can positioned next to them, and the patient can be rolled back on to it.

Improvised Stretchers

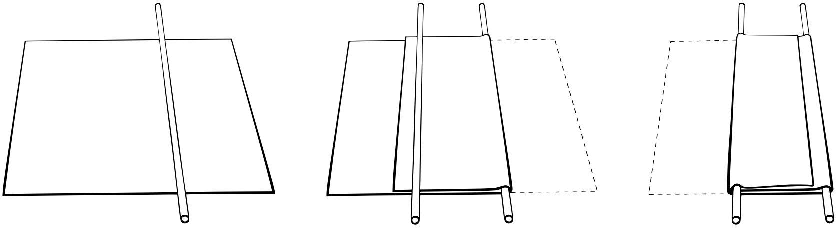
There are a number of ways to improvise stretchers. The following subset of methods are provided because they are simple and reliable.

Stretchers should be longer than the patient is tall. If this is not possible, patients without knee, lower leg, or spinal injuries can be transported in shorter stretchers with their legs hanging off the edge.

Tarp Stretcher With Poles

A stretcher can be improvised using a tarp or canvas banner and two poles (Figure 7.5). The tarp needs to be approximately longer than the patient is tall and roughly three times as wide. The poles need to be longer than the tarp.

Figure 7.5: Tarp Stretcher With Poles[33]



Place the tarp on the ground and place one pole approximately one third the distance from one of the sides. Fold the tarp over the pole so

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[iii] Use of commercial, foldable stretchers is not recommended for most medics. They are too large, heavy, and cumbersome to carry during actions in the offhand chance they are needed. If you have unofficial ambulance services, such as a comrade with a station wagon, use of commercial stretchers may be appropriate.

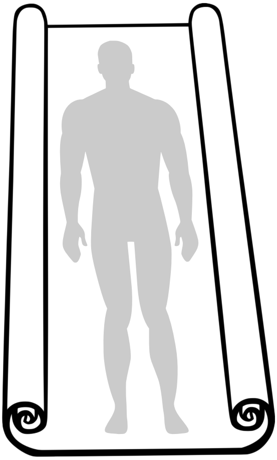
that the edge is slightly past the other one third marker. Place a second pole over this one third marker. Fold the remaining edge of the tarp back over the first pole.

The tarp will be held in place by the weight of the patient on the tarp and the static friction of the tarp against itself and the poles. The tarp can be additionally secured by long strips of duct tape on the fold perpendicular to the direction of the poles.

Tarp Stretcher Without Poles

A stretcher can be improvised using just a tarp (Figure 7.6). Place the patient on the tarp and tightly roll the tarp toward the patient so that a "handle" is created.

Figure 7.6: Tarp Stretcher Without Poles[33]

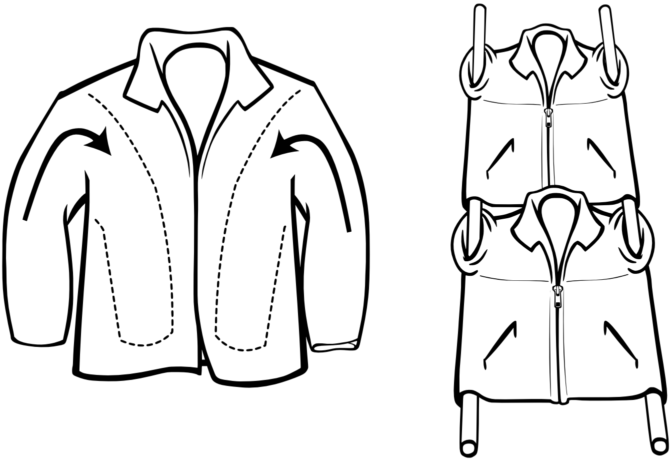


Jacket Stretcher

A jacket stretcher can be created using jackets and two poles (Figure 7.7). Jackets are preferred to sweaters or t-shirts because they are made of more durable materials. If t-shirts are used, they should be doubled or tripled up to prevent tearing.

Zip up the jackets and fasten all buttons. Tuck any hoods into the body of the jacket to prevent them from catching on anything while using the stretcher. Tuck the sleeves of the jackets inward through the body of the jacket. Slide the poles through the sleeves of the jackets.

Figure 7.7: Jacket Stretcher[33]



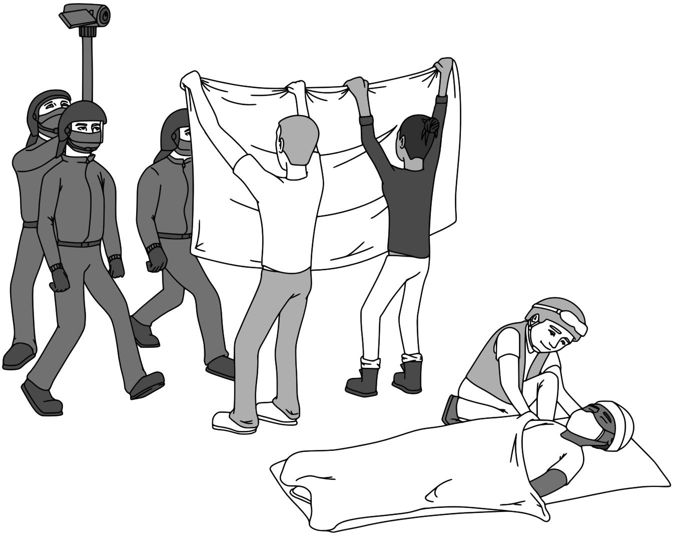
Protecting Patients During Evacuation

During patient evacuation, it is important to protect patients. This usually only means protecting them from arrest and identification during evacuation. Journalists may try to film or photograph patients for their story, and fascists may try to do the same for the purposes of doxxing. In some regions, police film protesters to use later in prosecution for rioting or property destruction.

During evacuation, fully wrap patients in emergency blankets or a tarp to hide their clothing. Place a surgical mask over their face to hide most of their facial features. In some regions, face coverings are illegal during protests, but a surgical mask can be described as medically necessary and police may tolerate this more than a bandana. Place a hat, beanie, or bandana over the patient's head to hide their hair. While moving them, other medics or volunteers can hold a canvas banner or emergency blankets between the patient and others to help hide them (Figure 7.8). This can typically be done on the legal basis of ensuring patient confidentiality.[iv]

[iv] As anarchists, we should not place faith in the law or legal institutions, but so long as they exist, we can leverage them against the State to protect patients.

Figure 7.8: Riot Cops with Camera[12]



Summary

What constitutes patient evacuation to advanced medical care depends on the exact context in which a medic is acting. This may mean a hospital or simply a temporary space designated for medical treatment. Evacuation procedures should be agreed upon by medics before an action, but they must also take into account patient consent. Medics should prefer to treat a patient in place unless there is risk to the patient. Lifts and drags should be coordinated so that all medics move as one. Medics should remember to move slowly as moving too quickly will likely do more harm than good.

8 : Psychological Care

> The victim who is able to articulate the situation of the victim has ceased to be a victim: he or she has become a threat.
>
> James Baldwin, *The Devil Finds Work*[34]

Treating patients goes beyond bandaging a wound or wrapping patients in a blanket and moving on. Providing care includes offering emotional support for the individuals who have been traumatized. Many injuries received while fighting fascists and the State are minor and leave little more than scrapes and bruises, but the lasting damage can be the sense of violation of one's own body or autonomy or the shock of experiencing injustice. This trauma often extends to people who haven't been injured themselves but have witnessed others being traumatized such as those present during instances of police brutality. Watching a comrade get abused can be emotionally taxing, and liberals who still believe in so-called "law and order" may be horrified by the repression protesters face.

Stress and psychological trauma may not only be directly related to what is occurring during an action. Individuals may have other stressors in their life, and an overt reaction may be due to built up stress breaking through, or something about the action may be a trigger for their past psychological trauma. This may be compounded by the fact that an action may not exist in isolation. For months on end, there may be weekly or even daily actions during widespread unrest.

Physiology

The stress response is a physiological phenomenon that leads to changes in the body, so familiarity with the various systems involved in experiencing stress and fear are useful for understanding how we respond to various stressors.[i]

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[i] Understanding the underlying mechanisms of stress helps in treating patients. It's too easy to say "they were freaking out," and knowledge of these mechanisms is

Nervous System

The human nervous system is divided into the central nervous system and the peripheral nervous system. The central nervous system consists of the brain and the spinal cord, and the peripheral nervous system consists of all other nerves and ganglia.

The peripheral nervous system is divided into the somatic nervous system (voluntary) and the autonomic nervous system (involuntary).[ii] The somatic nervous system consists of sensory neurons and motor neurons, and it is responsible for the transmission of information to the brain, voluntary control of the skeletal muscles, and reflex arcs in skeletal muscles. The autonomic nervous system consists of the nerves that control smooth muscle, glands, and internal organs.

The autonomic nervous system is divided into the sympathetic and parasympathetic nervous systems. The two systems act in a complementary opposition to one another (antagonistic control). The sympathetic nervous system is often likened to the accelerator and the parasympathetic nervous system to the brakes. The sympathetic nervous system is responsible for the functions of the body that prime it for action and quick responses, in particular the "fight or flight" response. The parasympathetic nervous system is responsible for the functions of the body associated with resting, often simplified to "rest and digest" and "feed and breed." Some of the specific effects of these two systems can be seen in Table 8.1.

The Stress Response

The human stress response activates systems in the body in order to prepare it for action as a means of survival. The stress response involves feedback loops between different "systems." These systems include information received from sensory organs, cognitive appraisal of the stressor, neurological triggering mechanisms, the neuroendocrinological response, activation of the target organs, and our ability to cope.[36] The stress response may begin at a sub-emotional level ("gut feeling") and eventually become a full-blown emotional response to a stressor. It is important to note that the autonomic nervous system's output is influenced by emotions generated in the cerebral cortex and limbic systems.[35,iii] Simple examples of this include blushing from embarrassment, "butterflies

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one way to avoid this pitfall. Compassion and experience are other means to this end. I cannot, however, teach compassion and give you experience via this book, so this chapter leans more into the biological bases of stress.

[ii] Additionally, there is the enteric nervous system which controls the functions of the gastrointestinal tract.

Table 8.1: Effects of the Autonomic Nervous System[35]

Organ	**Sympathetic Effects**	**Parasympathetic Effects**
Heart	Increased heart rate and contractility	Decreased heart rate and contractility
Lungs	Dilation of bronchioles	Constriction of bronchioles
Blood vessels	Dilation in skeletal muscle, constriction in GI tract	—
Sweat glands	Activation of sweat glands	—
Eye	Pupil dilation	Pupil constriction
Liver	Increased glucose release	Increased glycogen production
Adipose tissue	Fat breakdown	—
Stomach / intestines	Decreased motility	Increased motility
Bladder	Retention of urine	Release of urine
Penis / testes	Ejaculation	Erection
Uterus	Contraction	Engorgement and secretions

in one's stomach" when they see their crush, or hair standing on end (piloerection) as a result of fear. Feedback from the stress response can further alter cognitive appraisal and the emotional response. This can perpetuate the body's stress response.[36]

When someone senses a threat, their eyes and ears send information directly to their amygdala. The amygdala is a part of the limbic system which, among other functions, processes emotional responses and helps form memories. The amygdala sends signals to the hypothalamus which sends signals to the adrenal glands which release epinephrine (adrenaline).[iv] The individual experiences increased heart rate, blood pressure, and respiratory rate; dilated bronchioles; sharpened senses; and a release of stored glucose.[38]

The impulses that begin in the sensory neurons likewise project into the neocortex causing an increase in muscle tone and at times even complete motor activity.[36] This cascade from external stimulation to the bodily reaction can be faster than humans can perceive. If you've ever

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[iii] Of the effect perception has on the stress response, Hans Selye famously said, "It is not what happens to you that matters, but how you take it."[37]

[iv] It should be noted that adrenal fatigue, the idea that sustained stress can cause adrenal glands to produce insufficient levels of hormones like cortisol and epinephrine, does not exist.[39,40] Adrenal fatigue is pseudoscience. This urban legend is briefly noted here because it is something that has occasionally been mentioned by medics and activists.

jumped out of the way of danger before you realized what you were doing, you surely understand this.

Figure 8.1: Sabo-Tabby Displaying an Acute Stress Response[v]

If the body still perceives a threat after this initial surge of epinephrine, the body keeps the sympathetic nervous system activated via a hormonal cascade taking place via the hypothalamus, pituitary gland, and the adrenal glands. These feedback interactions are known as the hypothalamic-pituitary-adrenal axis (HPA axis). The activation of the HPA axis causes the release of the hormone cortisol[vi] from the adrenal glands. Cortisol increases blood glucose by generating glucose from non-carbohydrate sources (gluconeogenesis) and by breaking down glycogen stores (glycogenolysis), and it counteracts insulin which can lead to hyperglycemia. Cortisol also suppresses the release of inflammation causing substances as well as generally suppresses the immune system due to its high metabolic demand. Other endocrine axes are activated including the adrenal-cortical axis which releases endorphins which increase the individual's pain threshold. When the threat is no longer perceived, the HPA axis returns to normal activity, and cortisol levels fall. The parasympathetic nervous system dampens the stress response.

Stress and Psychological Trauma

Stress can be broadly described as a real or perceived threat to homeostasis.[41] This can be fear, injury, disease, or even simple things like exposure to the cold. Stress, with or without lasting psychological trauma, leads to the physiological changes discussed in the previous section.

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[v] The Sabo-Tabby, or by its more canonical name "The Black Cat," is a symbol associated with the IWW, anarcho-syndicalism, direct action, and (most specifically) sabotage.

[vi] Cortisol is not only a hormone that is released in response to a stressor. It also helps regulate bodily functions, and its release into the body follows a diurnal cycle.

Stress can also manifest from non-psychological causes. Exposure to the cold, blood loss, and the consumption of caffeine are examples of biogenic stressors. Absent appraisal by the individual, they still elicit a stress response from the body.[36]

It should also be noted that not all stress is bad or harmful. Some amount of stress is beneficial and can lead to motivation, and a total lack of stress can make life feel boring or dull. Additionally, perception of a stressor as positive can lead to growth and joy.

Psychological Trauma

The DSM-5 defines a traumatic stressor as "any event (or events) that may cause or threaten death, serious injury, or sexual violence to an individual, a close family member, or a close friend."[42] This definition must be expanded upon to include witnessing such events, even when those harmed are unknown, and it must remove the caregiver's subjective assessment of the severity of the stressor.[vii] Some people may live through brutal violence relatively unscathed, but what may seem like a minor stressor can still cause great distress and trauma to others.[43]

In a social movement based on solidarity, one must consider violence happening to unknown comrades as a traumatic stressor. The slogan "An injury to one is an injury to all" dates back to the founding of the anarcho-syndicalist Industrial Workers of the World (IWW) in 1905,[44] and it persists over a century later in their current constitution[45] as well as among other forms of labor organizing. Most importantly, it is used as a cry for solidarity in the anarchist and antifascist movements, and it captures the sense of harm that comes from watching local and distant attacks against our communities. The feeling is something deeply internalized, and many anarchists will feel gut-wrenching agony when watching the suffering of someone they will never know. There is evidence that viewing horrors on media[46] and content moderation on social media[47] are stressors that can lead to PTSD. Anecdotally most all of us know someone who has had to take a break from social media and reading the news to avoid gulping down the deluge of global human rights abuses.

Psychological trauma can be both acute and chronic, the former being associated with a single event or events happening over a short period of time and the latter being associated with long-term exposure to traumatic stressors. With all this in mind, the definition of a traumatic stressor

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[vii] This isn't just my opinion. Psychiatrists and other professionals agree.[36]

an injury to one is an injury to all

provided by the Jane Addams Collective is more applicable for medics as it is more general:

> Trauma can be defined as a psychologically significant/impactful event that creates a rupture in a person's sense of self, worldview, or view of the future.[48]

Some specific examples of traumatic stressors are experiencing or witnessing any of the following:[42,48,49]

- Death (both human and non-human) through accident, negligence, or malice
- Natural or human-made disasters
- Physical assault and abuse
- Arrest, abduction, disappearance, or imprisonment
- Injury or illness, particularly with grotesque or dramatic characteristics
- Sexual assault and abuse
- Emotional abuse
- Marginalization, invalidation, and dismissal

Exposure to traumatic stressors can lead to acute stress disorder (ASD) or post-traumatic stress disorder (PTSD). Failure to treat ASD (a short lived set of symptoms) can lead to PTSD (a long lived set of symptoms).[viii] Differentiating between these two is outside the scope of this book. The following clusters of symptoms and behaviors generally characterize PTSD and exposure to traumatic stressors.

[viii] This is somewhat of a simplification, but it follows the DSM-5's criteria, which suffices for this book.

Intrusion symptoms. Individuals may have intrusive memories and nightmares of the traumatic event. They may experience flashbacks and feel as though they are reliving the event and may disassociate to the point where they are unaware of their present surroundings.

Dissociative symptoms. Individuals may have an altered sense of reality or sense of disembodiment. They may have amnesia and be unable to fully remember the traumatic event. Note that these symptoms are different than disassociation during flashbacks.

Avoidance symptoms. Individuals may actively avoid thinking about the traumatic event and other things that remind them of the traumatic event. They may also avoid people and places that remind them of the traumatic event.

Arousal symptoms. Arousal symptoms may be mild and only include sleep disturbances or sudden outbursts (both verbal and physical) directed at others. They may also include more severe symptoms like hyperarousal, hypervigilance, and an exaggerated startle response. Individuals may be perpetually on the lookout for threats in normally non-threatening situations.

Negative mood. Individuals may also have a generally negative mood and find it difficult to experience positive emotions. They may have persistent feelings of anger, guilt, or shame. They may have persistent negative beliefs about themself ("I am worthless") and of the world ("Everyone is bad"). They may feel estranged from others and have reduced participation in their normal activities.

Psychological First Aid

Psychological first aid (PFA) is a framework for providing supportive, emotional care to individuals who have experienced traumatic events. It is not some exact set of steps, and you should adapt it to the cultural and social norms of your region. Additionally, PFA's background is in disaster response (like a hurricane, earthquake, or large terror attack), and as such it assumes that providers of PFA are dealing with a mass casualty incident (MCI). In most scenarios where medics are in service, the number of individuals that will need PFA at a given time is relatively low, and the individuals in need of care tend to be easily identifiable. Since medics typically do not operate in conjunction with governments or large NGOs, this book modifies the traditional PFA steps to fit the smaller scale and more autonomous nature of riot medicine.

The major goals of PFA include:

- Helping individuals feel safe

- Avoiding retraumatizing or additionally traumatizing individuals
- Connecting individuals to other individuals and groups who can provide further aid
- Restoring a sense of autonomy

Like how medical first aid is the initial step into managing a wound, PFA is the initial step in the process of recovery from trauma. Judith Herman described this process as follows:

> The fundamental stages of recovery are establishing safety, reconstructing the trauma story, and restoring the connection between survivors and their community.[50]

Long-term recovery from trauma it is not something that falls under the umbrella of PFA and riot medicine. Medics are encouraged to get involved with other collectives that offer psychological care, though that is outside the scope of this book. Such specialist resources for psychological care may already exist in your community, and you may be able to connect patients to them. Activist Trauma Support[51] previously operated in the UK, QueerCare[52] currently operates in the UK, and Out of Action[53] currently operates in Germany. For further reading, see *Mutual Aid, Trauma, & Resiliency* by the Jane Addams Collective.

It should also be noted that PFA is not the same as psychological debriefing (PD). PD generally involves discussion of the traumatic event with emphasis on finding out what the individual thinks happened and explaining what actually happened. PD is not effective in reducing PTSD and may cause harm, and thus it is not recommended.[54,55] PFA aims to avoid retraumatizing the individual, something that may happen if they are made to discuss the traumatic event.

PFA Steps

PFA uses some some combination of the following steps.

Ensure your own safety. Like with other first aid, you need to ensure your own safety. If police are still actively terrorizing individuals, you may not be able to intervene and begin care. If fascists have made an incursion into your action and there is street fighting, you may not be able to help until the violence has died down.

Identify who needs care. Identify who needs care and quickly triage them. Individuals with moderate and severe physical injuries should take priority over individuals who have been traumatized. The basics of PFA is kindness and calmness which is something most people can provide, but you as a medic may be one of a small number of people who can offer medical care. Individuals who have been on the receiving end of violence may not always be the ones who need care as they may have expected said violence and used proactive coping measures to prepare for it. Look for individuals who seem frozen, dazed, or panicked. They are the ones more likely to need PFA.

Introduce yourself and obtain consent. Like with first aid, identify yourself and obtain consent to treat the individual. State your qualifications, what you are able to offer, and ask if you can assist them.

Remove the patient from the source of trauma. If the patient is still in a chaotic environment or near where a traumatic incident took place, you may not be able to care for them or help calm them. Consider moving them somewhere that is calmer and has a greater sense of security than their current location. This may not be possible, or you may need to stay close to the area where the traumatic event occurred so that others may be able to find you for medical care.

Separate the calm from the panicked. If you have multiple patients, you may need to separate the calm-but-traumatized from the panicked patients. The patients who are panicked and highly animated may erode the small amount of calmness in other patients.

Keep nosy busybodies away from patients. Bystanders may be curious about what happened and ask invasive questions to the patients. This may further traumatize them as it may force them to speak about the traumatic event, and it can interfere with their ability to feel calm and safe. Journalists may try to take photos or ask questions to get a scoop. Keep busybodies and journalists away from patients.

Help the patient feel safe, comfortable, and calm. Help the patient feel safe. Moving them to a safe location is a good first step. Telling them that you are here to help and that others are there for support can be helpful. Offer them something to drink or a snack. If they are crying, offer them tissues. While quite simple, this is a powerful gesture that symbolizes both care and a return to normalcy. Speak to them in a calm and reassuring voice, both in tone and content.

Keep the focus on the patient. Ask the patient about how they feel, and avoid making your interaction about how you feel. Keep your judgement about the event and your appraisal of their response out your treatment. It does not matter if you think their reaction to the traumatic event is appropriate or not. Don't tell them they're overreacting. All feelings are valid. You are there to provide care and support regardless of your interpretation of the event.

Do not lie or misrepresent the situation. While you attempt to calm and reassure the patient, do not lie about resources available or the current situation. If there are unknowns, you may state so, and you may choose to omit some details if they are not relevant or helpful. However, do not make statements like “everyone is fine” or “nothing bad is going to happen to you now” unless you know with certainty that such statements are true.

Be mindful of how you communicate. Communication isn’t just words alone but tone, facial expressions, and posture. Try to see yourself from the patient’s eyes considering your relation to them both culturally as well as through your relative privileges. Maintain a pleasant disposition. Face your body towards them, and keep your focus on them. If they are sitting, either sit or squat so you do not loom above them. When they talk, nod your head so they can see that you are actively listening.

Consider offering physical contact. Some patients may find physical contact to be helpful and calming. This may mean a hand on their shoulder, holding their hands, or a hug. Ask for content before touching a patient, and be explicit about what kind of physical contact you are going to offer. For example, clearly say, “would you like a hug?”

Prompt the patient to speak. Ask the patient if they would like to speak about what happened. Do not force them to discuss anything as this may retraumatize them. Allow for long pauses as they collect their thoughts. Repeatedly asking them questions can add to the stress of the situation and interrupt their train of thought. One exception to this is if there is still an active threat and they were one of a small number of witnesses. If there is still danger (like an armed assailant), you may need to get them to answer basic details to help protect others.

Use grounding techniques. The patient may be panicked or disassociated from the current situation. Encourage them to breathe slowly. Help them identify 5 things they are feeling (physically) and 5 things they can see or hear that are calming. Ask them what they see in the clouds, what the weather is like, or if they can hear any birds. Have them put their feet firmly on the floor or their hands in the lap, and ask them to describe the feeling.

Enable self sufficiency. Once you have attended to the patient’s immediate needs like safety and minor material comforts, ask them what they need. Do they need to get home? Do they have friends at the action who can help them? Are they worried about someone else at the action, and can you help them find this person? Do they want to be connected with more qualified providers of psychological care? Facilitate their own autonomy.

Create a plan. Help the patient come up with a short-term plan they can immediately enact. For example, make a plan to get them home. Discuss this with them, and then act on it.

Connect them to support. Help connect the patient to support in their life such as friends, family, or other organizations that work with activists. Ask them what they have done to cope in the past, and suggest they try using these measures again. If you know of support networks for activists or traumatized individuals, provide them with business cards or a means of contacting this additional care. Even something as simple as a left-leaning community kitchen where they can meet others may have some benefit.

Suggest and encourage positive coping. Your care may be brief, but the patient may need ongoing care. Some of this care can be done on their own, and you can encourage healthy coping strategies such as:

- Getting enough sleep
- Remembering to eat and drink enough water
- Staying connected with and talking to friends, family, and comrades
- Finding someone with whom they can talk about their trauma
- Spending time with their pets
- Continuing to engage in fun and relaxing activities like game night, reading, or seeing live music
- Exercising and spending time outdoors, even if it's as simple as walking around their neighborhood

Discharging your patient. You do not want your patient to feel abandoned. You may have to care for others, and if you need to leave your patient temporarily, tell them so, and tell them you will be back. If you need to end care because they are leaving or you need to leave, ensure they have been connected to someone or another group that can continue to care for them. This connection should not be vague and abstract, but concrete. Introduce them to someone, and ensure that the next provider is aware that you are transferring care. Of course, no such provider may be available, and you do not have unlimited time to spend with each patient. You may not be able to give a proper hand-off, and you may have to attend to your own needs. Do what you can to make the termination of care not feel abrupt.

Your Acute Stress Response

In addition to understanding how to provide psychological first aid to others, medics should know how to regulate their responses to acute stressors.

The belief that you can overcome obstacles reduces the amount of stress you experience. Such a belief can be cultivated through studying, practice, and experience. Experience with protests, and in particular having a sense of what will or will not happen, can prevent, or at least minimize, acute stress responses to police movements and attacks.

Secondary to preparation, the stress response can be reduced as it begins via a conscious effort to be calm and to relax. Perhaps in the past you've felt the trickle of stress hormones when you see a line of riot cops don their helmets in preparation for a charge. Use of the grounding techniques, something often practiced by individuals who have PTSD or experience panic attacks, can help you give order to the world and reduce stress.

There are many grounding techniques, though not all are appropriate for use during an action.[ix] Practices that are meditative in nature are helpful. Slow, deep, rhythmic breathing while thinking calming thoughts may help. Describe to yourself what you see and feel.

- Can you feel the ground beneath your feet? Is it firm or soft, wet or dry?
- Is there wind? Which direction is it coming from? How does it feel on your face?
- How many cops do you see? What are they carrying?
- How many protesters are there? What are they doing?
- How does your backpack feel? Is it heavy or light? Tight or loose?
- What is in your pockets? Can you feel these items pressing against your body? What do they feel like?
- What is the weather like? Are you warm or cold? Do you have goosebumps, or are you sweating?

Being able to describe the world around you helps ground you in reality and move the focus away from the stressor. Answering such questions also helps you appraise the tactical situation.

These techniques, and in particular these questions, may not be helpful for you. You may find focusing on the police worsens your stress. Discover what works for you through conscious experimentation.

[ix] For example, closing your eyes and visualizing a peaceful scene is likely more dangerous than helpful.

Further, in your service as a medic, you may experience what is known as “compassion fatigue” or secondary PTSD which results from caring for others who have been traumatized and injured.[56] You should take note of the state of your mental health both while at actions and over longer periods of time to ensure that you are healthy enough to continue providing aid to your community.

Summary

As it has been said before, and as it will be repeated throughout this book, one of the ways a medic can help heal patients is by being a beacon of calm amidst chaos and panic. This calm can be used for organizing other medics and guiding treatment. Furthermore, it is a critical component of psychological first aid. Remember that calmness and composure do not mean that a medic needs to be stoic and lacking in outward compassion. PFA involves making the patient feel safe and calm, attending to their basic needs, avoiding retraumatizing them, and connecting them to additional means of care. Help the patient come up with a short-term plan they can act on to help them restore their autonomy.

9 : Medication

> Give people what they need: food, medicine, clean air, pure water, trees and grass, pleasant homes to live in, some hours of work, more hours of leisure. Don't ask who deserves it. Every human being deserves it.
>
> Howard Zinn, *Marx in Soho*[57]

There are different schools of thought on whether medics should carry or administer medication to patients, and these decisions are often based on both ethical and legal considerations.

The human body is complex, and medications have complex interactions with each other. Without medical qualification to do so, administering medication can cause harm to the patient, even if it is a simple over-the-counter (OTC) medication.

From a legal standpoint, you may be liable for any complications a patient suffers as a result of your administration of medication or facilitating a patient's self-administration as this falls outside your scope of practice. In some regions, police may treat any pills, even if individually packaged and clearly labelled, as controlled substances and may use this as grounds to arrest you even if they know the charges will be later dropped. For these reasons, some medics will choose to not carry medication.

Administration

Medics typically will make one of the three following choices on choosing to carry medication. In this chapter, the term "basic medication" means medications like OTC medication, oral glucose, salbutamol inhalers, and epinephrine autoinjectors.

Facilitating Self-Administration

Carrying basic medication and facilitating patient self-administration is reasonably safe both in terms patient safety and legal risk. If you choose to carry medication and think it is appropriate that the patient self-administers, you should be sure that the patient is of clear mind to do so. Their level of consciousness should be A+O×4 using the AVPU scale, and they should be sober. Additionally, it is important that you clearly state your medical qualifications and do not attempt to influence their decision to take the medication. For example, if your patient appears to be suffering an asthma attack following exposure to tear gas, you could say, “I am carrying a salbutamol inhaler. If you know how to use it and have taken this kind of medication before, you may want to consider doing so. However, I am not a doctor, so I cannot say whether you should or whether it is safe to do so.”

No Medication

Carrying no medication carries the lowest risk to both patient and medic, though patients may find it bothersome, “unprofessional,” or “unprepared” that medics do not have basic medication, in particular pain-relievers. If you choose to not carry medication, be prepared to explain why you do not, namely that you are not medically qualified to administer medication, and that there is risk of harm to the patient and legal risk to you.

Administering Medication

Carrying basic medication and administering it to patients is an acceptable practice, but facilitating self-administration is somewhat preferred. Unless you have the appropriate training, there is risk of causing complications in a patient in an already chaotic environment, and you may face legal risk of administering medication while acting in a medical capacity. If you choose to do so, you can take several steps to reduce the risk of harm.

Like with facilitating self-administration, the patient’s level of consciousness should be A+O×4 and they should be sober. Avoid administering medication that the patient has not taken before. Naturally, both of these guidelines do not apply when administering naloxone or epinephrine as the patients may not be conscious.

Only carry a small number of common, well-understood medications. Memorize the contraindications for all medications you carry as well as potentially harmful drug interactions. Consider printing this information on cards, laminating them, and putting them in your medication pouch so that you may quickly consult them before administering medication.[i]

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[i] Additionally, there are a number of apps for mobile devices made for doctors and pharmacists. These apps will include contraindications and dangerous drug interactions. Some of these apps require a costly monthly or yearly subscription, and thus they may not be suitable for riot medics. A review of these apps is outside the scope of this book.

Summary

Administering medication can be harmful to the patient and may place you at legal risk. You may want to consider neither carrying nor administering medication to protect patients and yourself. If you choose to facilitate patients to self-administering, or if you choose to administer medications to patients, you should do so cautiously.

This book covers basic administration of medications to help educate medics. Doing so is not an endorsement of carrying or administering medications, and it is done to help instruct medics on how to do so safely. Likewise, the warnings in this chapter are not proscriptions against carrying medication.

10 : Alternative Medicine

> To be truly visionary we have to root our imagination in our concrete reality while simultaneously imagining possibilities beyond that reality.
>
> bell hooks, *Feminism is for Everybody*[58]

Riot medics' knowledge is often passed along from one medic to another, and even in cases where genuine benefit is gained from certain treatments or practices, there are not clinical trials or published research to back claims. Thus, along with the valid knowledge, urban legends are circulated and taken to be true. There is evidence supporting use of traditional and folk medical treatments for illnesses and injuries, and this chapter is not attempting to claim that all traditional and folk medicine is quackery. However, if you are considering using any treatments, they should be backed by credible research or at the very least have a strong basis in biology, chemistry, and physics.

Furthermore, one must also consider the efficacy of folk medicine compared to what is used in hospitals and by doctors. While some folk medicine remedies and practices may be effective, they are often neither more effective nor cheaper than what one finds in hospitals and textbooks. An in-depth discussion of this is outside the scope of this book.

This chapter was added because in the course of researching street medics' practices for this book, it was found that there were blogs, wikis, zines going back over a decade, and other street medic resources that recommended alternative medical practices and treatments that have been widely debunked and considered shams. This chapter attempts to address these urban legends. Other urban legends are addressed in their relevant chapters.

The Left and Medicine

Beliefs in alternative medicine, as well as more general antiscientific beliefs, exist throughout the modern world. They can be found in many countries and nearly all political ideologies. Anarchist spaces are not immune to beliefs in alternative medicine or outright antiscience.

The same skepticism anarchists use to question the so-called "natural order" of the world around them is also turned towards the institution of Science Itself. In living memory, there have been obvious failures of science. Thalidomide caused birth defects, there have been numerous nuclear meltdowns, and the "science" of economics has repeatedly brought the world economy crashing down. Elements within the hippie movement of the 1960's equated science with the establishment and "the man." The anti-GMO, anti-nuclear, and anti-Big-Pharma movements are more recent currents within the left that have led to skepticism against institutional science. In particular, with regards to medicine, the 1990's saw wide popularity of medical advice often being "just take a pill" before being replaced with approaches that were holistic and more "natural," though still backed by science.

Rightfully, science should be questioned. Scientists may chase evidence that proves their own biases, and pseudosciences like phrenology experienced wide popularity before being generally discredited. Science is also a fundamentally hierarchical discipline that often inadvertently, or even intentionally, protects the status quo. The anarchist Ursula K. Le Guin wrote about this in her 1974 novel *The Dispossessed.* In his autobiography, Max Planck described the conservative nature of science which went on to be known as the Planck Principle.[59]

> An important scientific innovation rarely makes its way by gradually winning over and converting its opponents: it rarely happens that Saul becomes Paul. What does happen is that its opponents gradually die out, and that the growing generation is familiarized with the ideas from the beginning: another instance of the fact that the future lies with the youth.

The Planck Principle itself was studied and shown that following the unexpected death of superstars within a field, authors who had not previously collaborated with the deceased had an increase in publications.[60]

This top-down approach and resistance to change can be true in anarchists spaces, but the opposite can also be true. Esoteric knowledge, like street medicine, is passed on by word of mouth and in zines from the older anarchists to the younger. In some regions, many anarchists "age out" of the movement in their early thirties, and institutional knowledge is quickly lost. Anarchists are also more inclined to trust other anarchists than the types of institutions they fight against. The use of folk science and "works for me" as criteria for continued usage of a particular treatment leads to antiscientific practices.[i] While this is an effective way of sharing and conveying information in a decentralized and non-hierarchical way, it results in misinformation being taken as gospel and further distorted through some sort of game of telephone.

Debunked Treatments

Not all pseudoscientific medicine can be individually addressed, and there is insufficient time to argue against each or in favor of evidence-based medicine. Aside from the ones listed here, other alternative medical treatments have been claimed to have been used by medics, and all should be avoided. This includes, but is not limited to, magnet therapy, reiki ("energy" transfer), crystal healing, and cupping therapy (the use of suction cups placed on the skin).

Homeopathy

Homeopathy is, in part, the practice of repeatedly diluting a chemical until virtually none of the original chemical remains (and in some cases not a single molecule remains). Proponents of homeopathy claim that via "water memory" the water retains the chemical and pharmacological properties of the original chemical that was present prior to dilution.[61] This claim goes against modern understanding of biology, chemistry, and physics, or as one author put it: "the main assumptions of homeopathy are biologically implausible."[62]

Medics have written about using homeopathic remedies to treat different illnesses and injuries including riot control agent contamination and blunt trauma. Medics must never use homeopathic treatments or recommend patients seek further treatment via homeopathic remedies. At best, homeopathy performs no better than placebo,[62–64] and studies that claim otherwise tend to have poor design.[65,66] The following is stated in no uncertain terms: homeopathy is not medicine.

Paraherbalism

The use of plants as medicine extends far back into human history and can even be found in non-human animals.[ii] Herbalism is the study of botany and medicinal plants using the techniques of evidence based medicine. Paraherbalism is the pseudoscientific use of parts of plant and animals to create medicine and other health-promoting agents. Paraherbalism

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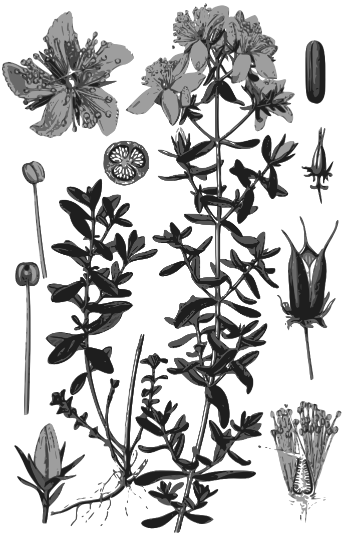
[i] Another place where anarchists are antiscientific is around counter-surveillance and anti-repression where tactics that worked decades ago may still be widely deployed despite changing police tactics, new technology, and actual ineffectiveness of that tactic.

tends to be linked to naturopathy, or the belief that the body can always self-heal and that natural and unprocessed products can guide the body's "vital energy." In general, medics should not use herbs or other plants to treat patients because of their limited efficacy and possible negative interactions.

St. John's Wort

A number of medic resources recommend St. John's Wort (Hypericum perforatum) as treatment for illness and injuries including riot control agent contamination, bruising, nerve damage, and acute stress. It is suggested to be administered as a tea, using extracted oils, or in pill form.

Figure 10.1: St. John's Wort



St. John's Wort alone can cause adverse drug reactions such as gastrointestinal irritation, nausea, headache, allergic reaction, fatigue, and restlessness.[67] It may cause photosensitivity leading to sunburns in conditions that would not harm most humans.[67] It may also interact with other foods or drugs leading to dangerously high blood pressure and serotonin syndrome (when taken with serotonergic medications like

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[ii] Animals using naturally occurring substances such as a plants and soils to self-medicate is known as zoopharmacognosy. Such behavior is fascinating.

SSRIs).[68] St. John's Wort also increases the metabolism of certain estrogens which decreases their levels in the body. In particular, this can reduce the efficacy of hormonal contraceptive medication.

Use of St. John's Wort can be summarized with the following quote:[67]

> Given what is currently known and unknown about the biological properties of [St. John's Wort], those who choose to use this herb should be closely monitored by a physician.

Medics are (typically) not physicians. They should not administer St. John's Wort.

Acupuncture

Acupuncture is the practice of inserting thin needles into the body, often as a means of pain relief. There have been cases of street medics recommending acupuncture as a treatment for acute stress and pain. Acupuncture is considered pseudoscience and has limited to no efficacy. Medics should not treat patients with acupuncture. Under ideal conditions with sterile needles, there is non-negligible risk of infection as well as traumatic pneumothorax.[69] In riot conditions, it is unlikely that a medic will be able to achieve acceptable sterility of their equipment to safely administer acupuncture as a treatment, not to mention the risk injury as a result of leaving needles in a patient during a physical confrontation.

Summary

Using alternative medicine to treat your patients or encouraging them to use such treatments can cause harm in as much as they replace genuine therapies. For this reason they must be avoided. Your patients will learn from you and try to emulate the treatments you have administered. Keeping treatments simple and using evidence-based medicine will help steer them towards better self-treatment in the future.

11 : Basic Life Support

> We are certain that communities of joy will emerge from our struggle here and now. And for the first time life will triumph over death.
>
> Alfredo M. Bonanno, *Armed Joy*[70]

Basic life support (BLS) is the steps taken to ensure that patients who are not breathing or do not have a pulse continue to have their brain and other organs supplied with oxygenated blood until they can be treated by more advanced medical personnel. This includes unblocking a patient's airway, artificial ventilation, and cardiopulmonary resuscitation (CPR).

BLS is taught to low-level EMS personnel as well as laypeople and contrasts with the advanced cardiac life support (ACLS) used by more trained medical practitioners. ACLS includes airway management via adjuncts, establishing vascular access via an IV, use of an electrocardiogram (ECG/EKG) to guide defibrillation, and emergency pharmacology. Covering ACLS is well beyond the scope of this book, and further doing so is not practical as medics will not have access to the necessary equipment.

Physiology

In order for the cells of our body to function, they need to be constantly supplied with oxygen and nutrients and have waste removed. This exchange of nutrients and waste is facilitated by the circulatory and respiratory systems.

Circulatory System

The circulatory system, sometimes called the cardiovascular system, is comprised of the heart, arteries, veins, capillaries, and blood among other tissues and organs. The circulatory system uses blood to deliver oxygen, nutrients, and hormones to cells as well as remove waste. The circulatory system also includes the lymphatic system, but discussion of this is outside the scope of this book. Figure 11.1 shows the major components of the circulatory system.

The heart (Figure 11.2)is made of four chambers: the left atrium, left ventricle, right atrium, and right ventricle. The left atrium receives

Figure 11.1: Circulatory System[33]

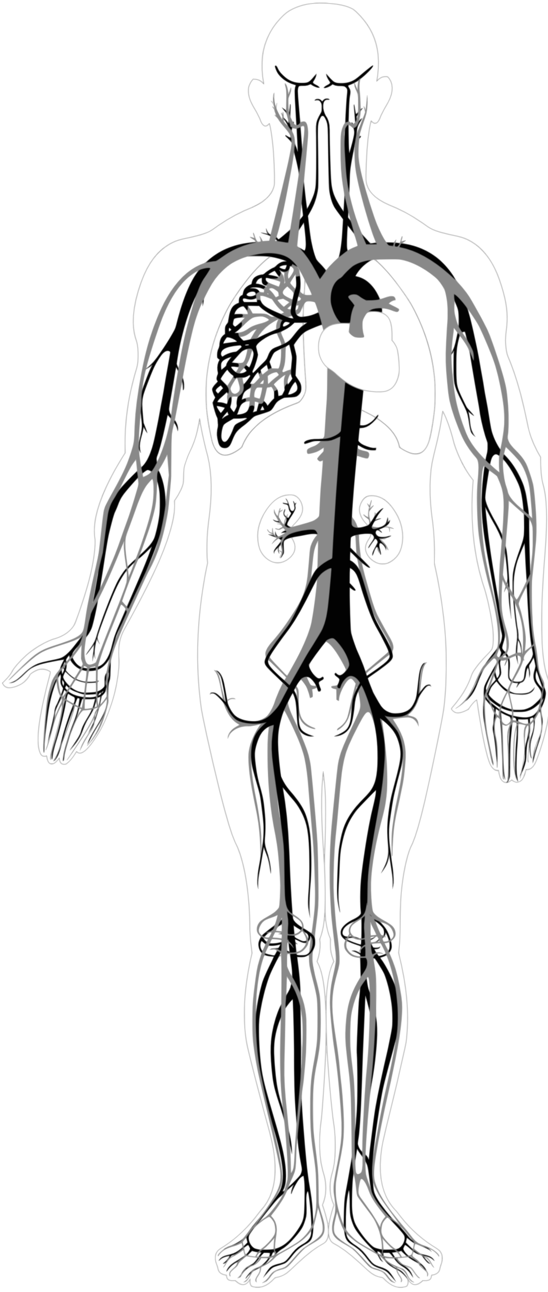
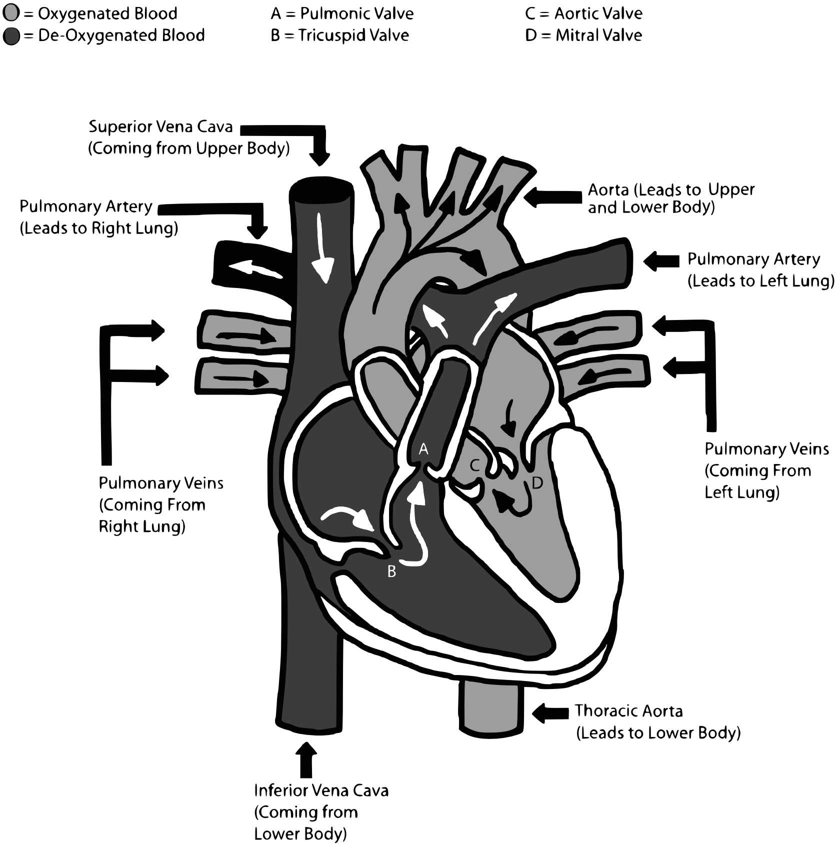


Figure 11.2: Structure of the Heart[24]


○ = Oxygenated Blood
● = De-Oxygenated Blood
A = Pulmonic Valve
B = Tricuspid Valve
C = Aortic Valve
D = Mitral Valve
Superior Vena Cava (Coming from Upper Body)
Pulmonary Artery (Leads to Right Lung)
Aorta (Leads to Upper and Lower Body)
Pulmonary Artery (Leads to Left Lung)
Pulmonary Veins (Coming From Left Lung)
Pulmonary Veins (Coming From Right Lung)
A
C
D
B
Thoracic Aorta (Leads to Lower Body)
Inferior Vena Cava (Coming from Lower Body)

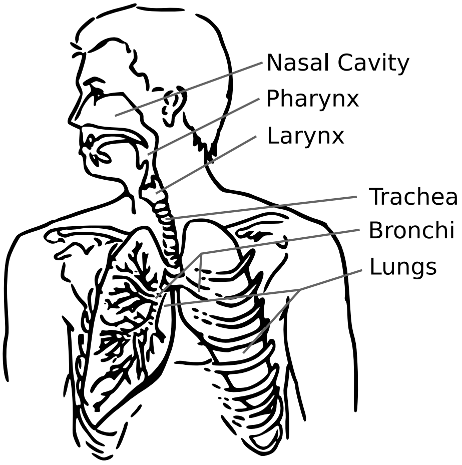
oxygenated blood via the pulmonary veins and pumps blood through into the left ventricle. The left ventricle pumps blood into the aorta which then branches off to deliver oxygenate blood to the rest of the body. The right atrium receives unoxygenated blood from body via the vena cavae and pumps blood into the right ventricle. The right ventricle pumps blood through the pulmonary arteries where it is delivered to the lungs for oxygenation.

Blood flows away from the heart via arteries that branch into smaller arteries, arterioles, and eventually capillaries where oxygen and nutrients are exchanged with cells. Blood flows back to the heart starting with capillaries that join together to form progressively larger veins, carrying carbon dioxide to the lungs.

Respiratory System

The respiratory system (Figure 11.3) is comprised of the mouth, nose, pharynx, larynx, trachea, bronchi, and alveoli. The respiratory system facilitates the exchanges of gasses in the blood with the atmosphere. Principally, the respiratory system moves oxygen into the blood and carbon dioxide from the blood back into the atmosphere.

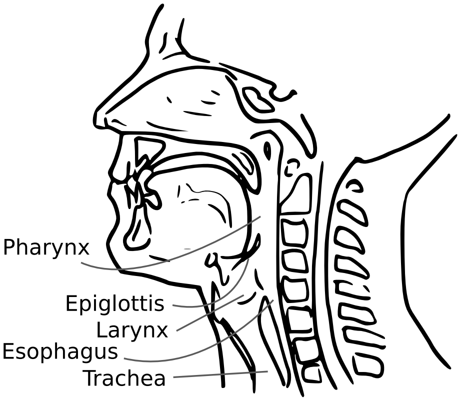
Figure 11.3: Respiratory System[71]



Air from the environment enters the respiratory system through the airway made up of the nose, mouth, and pharynx. Hairs in the nose help filter particles before the air moves into the lower respiratory tract. Additionally, the upper respiratory tract helps warm and moisturize air before it reaches the lower respiratory tract. The epiglottis is a structure at the entrance of the larynx that closes to prevent aspiration of food or liquid into the lungs. Air moves from the pharynx past the epiglottis into the larynx and down the trachea into the bronchial tubes. The bronchial tubes branch into progressively smaller tubes that end in the alveoli where blood is oxygenated and carbon dioxide is removed. Movement of air through the respiratory system is facilitated by the diaphragm.

In a healthy person, respiration acts as follows. During inspiration, the diaphragm contracts and moves downward, increasing the volume

Figure 11.4: Upper Respiratory Tract[71]



of the thorax. The external intercostal muscles contract and lift the chest up. Together, these create negative pressure that draws air into the lungs. The chest expands outward. During forced inspiration, accessory muscles in the neck and torso assist with the movement of the ribs upward to increase the volume of the chest cavity. Accessory muscles used in respiration include, among others, the sternocleidomastoids and scalenes of the neck; pectoralis major and minor; trapezius; and latissimus dorsi.

During passive expiration, the diaphragm relaxes, and the elasticity of the thoracic wall creates positive pressure that pushes air out of the lungs. The chest contracts. During forced expiration, internal intercostal muscles and abdominal muscles contract to force air out of the lungs.

Background

In Chapter 6 (“Patient Assessment”), you were instructed to check a patient’s ABCs (airway, breathing, circulation) as the first step for examining an unresponsive patient. A patient who is not breathing but has a pulse is said to be in respiratory arrest. A patient who has no pulse is said to be in cardiac arrest.

Cardiac arrest may not mean the heart is not beating at all, only that the heart is ineffectively pumping blood. A heartbeat as felt by a hand on the chest does not imply that there is a pulse or that blood is effectively pumping through the circulatory system. The heart in patient experiencing ventricular fibrillation quivers instead of pumping blood. Ventricular tachycardia is a type of rapid heart heart rate (over 100 BPM) that may lead to cardiac arrest. A subtype of ventricular tachycardia is pulseless ventricular tachycardia where the rapid heartbeats are not able to produce a pulse. The two irregular heart rhythms are noted as they are the two shockable rhythms meaning they can be treated with defibrillation. However, they can only be diagnosed with an ECG or AED.

Clinical death is defined as both the cessation of blood circulation and breathing. A patient in cardiac arrest is said to be clinically dead. Brain death is the irreversible cessation of brain function, both the voluntary as well as involuntary functions that sustain life. A patient who is clinically dead may be resuscitated via CPR or other interventions, but a patient who is brain dead cannot be resuscitated. Without intervention, and at normal temperatures, brain death follows clinical death within minutes.

Brain tissue is sensitive to insufficient oxygen (hypoxia) or absence of oxygen (anoxia). Within minutes of cardiac arrest, the brain will suffer permanent damage. A patient in respiratory arrest will enter cardiac arrest within several minutes. In both cases, it is critical to ensure oxygen delivery to the brain and other tissues to prevent damage and increase the survival rates.

In a 1985 study on patients who experienced out-of-hospital cardiac arrest (OHCA) caused by heart disease that included treatment by EMS, rapidly beginning CPR showed increased survival rates, where survival was defined as eventual hospital discharge.[72] In Figure 11.5 and Figure 11.6, it can be seen that survival rates are drastically higher when a bystander immediately began CPR compared to the delayed start of CPR.

Even with the increased survival rate, medics should be cautious of overestimating the actual effectiveness of CPR on patients in cardiac arrest. Variables like age, the underlying cause of the respiratory or cardiac arrest, and patient's overall health can significantly affect the actual survival rates. Portrayals of CPR on TV often overstate the likelihood of survival in the short-term (return of spontaneous circulation, ROSC) and long-term (discharge from hospital).[73,74] A comparison of these values can be found in Table 11.1. Even outside of these overly effective portrayals, many people overestimate the effectiveness of CPR as having an expected long-term survival rate between 65% and 74%.[75]

Even further, the actual survival rate for all cases of cardiac arrest, including both cardiogenic causes and other causes, is between 10% and 15%.[75] These statistics are not meant to discourage you from attempting CPR on a patient in cardiac arrest. They are merely here to give you

Figure 11.5: Paramedic Arrival Time vs. Survival Rate[72]

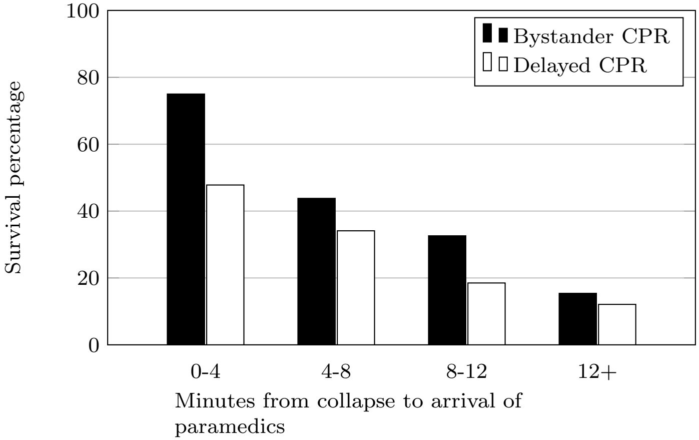


Figure 11.6: CPR Duration vs. Survival Rate[72]

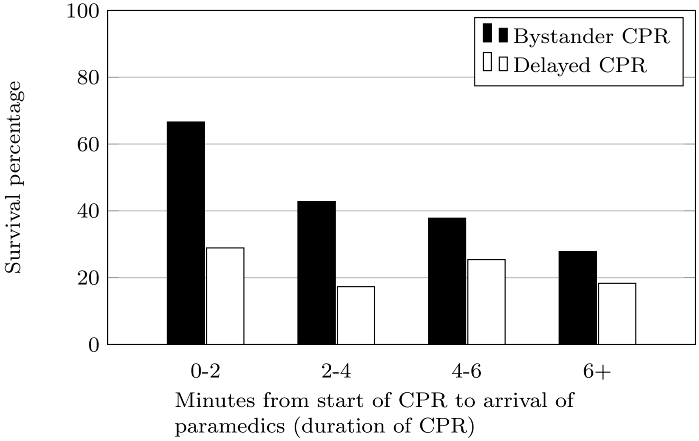


Table 11.1: CPR Survival Rates[73]

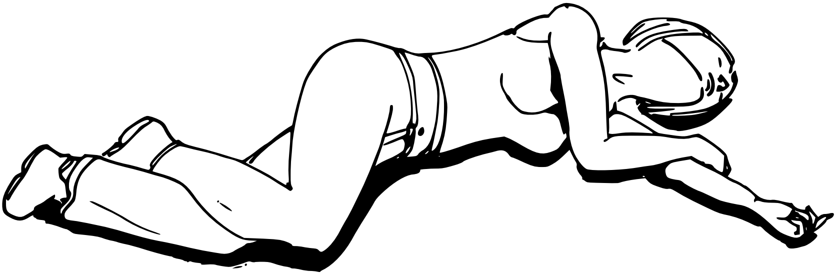
	TV	**Reality**
Short-term survival	75%	< 40%
Long-term survival	67%	< 30%

realistic expectations of success. Even in the cases where a patient does not survive, performing CPR allows for the possibility that the patient's organs can be used for transplants.

Rescue Position

The rescue position, also known as the recovery position, helps prevent aspiration of fluid or vomit (Figure 11.7). It is used on all unconscious patients as well as patients who are conscious but at risk of becoming unconscious. The rescue position is a three-quarters prone position used to help protect a patient's airway.[i] To place a supine patient into the recovery position, use the following steps:

Figure 11.7: Rescue Position[76]



1. Position yourself on the patient's left side.
2. Position the patient's left arm so that it makes a right angle with their torso.
3. Raise the patient's right leg.
    (a) Use your left hand to grab the patient's right leg below the calf.
    (b) Use your right hand to grab the patient's right thigh where it meets the knee. If possible, grabbing clothing is easier.
    (c) Lift the patient's right thigh, and move their foot toward their buttocks
4. Place your right hand on the patient's right shoulder.
5. Roll the patient toward you on to their side.
6. Bring the patient's right knee up toward their chest.

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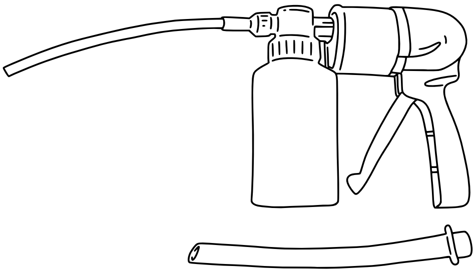
[i] There are many variations of the rescue position, and this book has chosen one for instruction. If you are familiar with another, you may just as well use it instead.

Figure 11.8: Manual Suction Pump[12]



7. Place the patient's right arm over their left arm.
8. Reposition the patient's head for drainage.
    (a) Their mouth is open.
    (b) Their airway is open as if using the head-tilt maneuver.
    (c) Their head is at the lowest point of their body to allow gravity to drain fluid from their airway.

Note that, aside from relevant injuries, there is no requirement to have the patient on their left or right side. One side was chosen to make it easier to follow the steps.

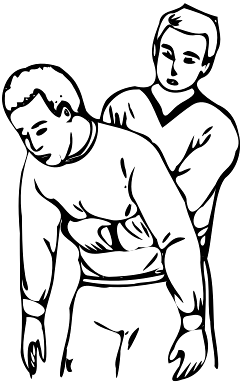
Manual Suction Pump

A manual suction pump (Figure 11.8) is a hand-actuated pump that uses a catheter to suck fluids and small objects from a patient's airway. To use a manual suction pump, attach the cannister to the pump, and attach the catheter to the cannister. Place the catheter in the patient's mouth, and actuate the pump to create suction to remove fluids. A manual suction pump should be used if there is fluid in the patient's airway. This may be blood, saliva, or vomit.

Abdominal Thrusts

A patient's airway may become obstructed by a foreign object. This may happen while they are still conscious, or it may happen after they lose consciousness. You will need to dislodge this obstruction to prevent loss of consciousness or to allow you to ventilate their lungs. This is done via abdominal thrusts, also known as the Heimlich maneuver.

Figure 11.9: Standing Abdominal Thrust[77]



In Conscious Patients

If your patient is still standing, obtain consent to help them. Begin by giving them 5 firm strikes on their back between their shoulder blades. If this fails to dislodge the obstruction, perform abdominal thrusts.

To perform abdominal thrusts, first position yourself behind the patient with one foot between the patient's legs (Figure 11.9). Wrap your arms around their torso under their arms. Make a fist with one hand and place it at the halfway point between their navel and the inferior end of their sternum. Use your other hand to grasp your wrist. Pull inwards and up as if you are trying lift the patient. Repeat this 5 times.

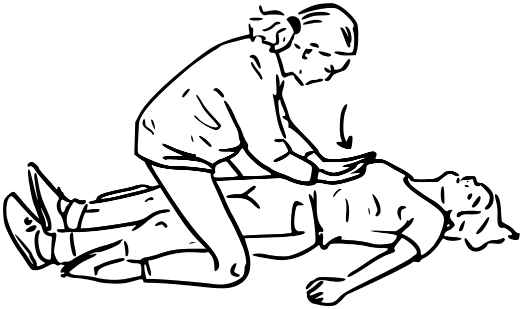
Alternate between 5 back strikes and 5 abdominal thrusts until the obstruction is dislodged. If the patient loses consciousness during this process, lay them on their back while taking care to prevent their head from hitting the ground, then follow the steps for unconscious patients.

In Unconscious Patients

Begin by laying the patient on their back. Before giving abdominal thrusts, check the patient's airway for foreign objects. Use your fingers, Magill forceps, or a manual suction pump to remove the objects. When removing foreign objects, ensure you do not push them further into the patient's airway.

To perform abdominal thrusts in an unconscious patient, position yourself straddling their legs and pelvis (Figure 11.10). Place the heel of one of your hands on the patient's abdomen at the halfway point between their navel and the inferior end of their sternum. Place your

Figure 11.10: Supine Abdominal Thrust[71]



second hand on top of the first and interlock your fingers. Lock your elbows, and thrust in a J-shape, first going slightly towards their back then up into their thoracic cavity. Give 5 abdominal thrusts then check for obstructions, removing any that are found. Note that abdominal thrusts are only given if you know that the patient is choking, otherwise begin artificial ventilation and chest compressions.

Artificial Ventilation

Artificial ventilation is the process of inducing or assisting respiration either mechanically or manually. For medics, this means using a device to allow them to blow air into a patients lungs either using air from their own lungs or air from the environment. Artificial ventilation helps maintain oxygenation of a patient's blood until they can breath on their own.

In addition to patients in respiratory or cardiac arrest, patients who are breathing insufficiently may need artificial ventilation. This means patients with a depressed respiratory rate (bradypnea), central cyanosis, or a decreased blood oxygen saturation.

Airway Management

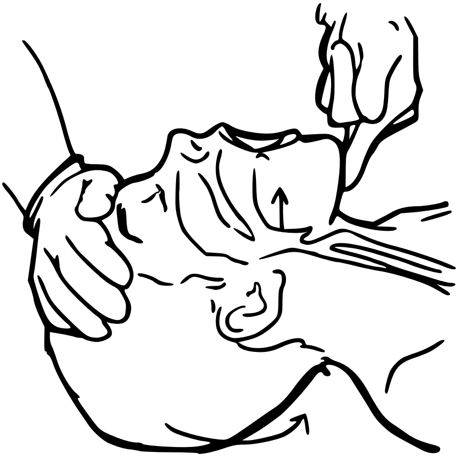
In order to be able to be able to move air in and out of the lungs, the medic needs to ensure the patient's airway is unblocked and remains open for the duration of the care. Advanced techniques involve using adjuncts to prevent the patient's tongue from covering the epiglottis (erroneously called "swallowing one's tongue") or to prevent aspiration of vomit, blood, or other foreign material. Use of adjuncts is outside the scope of this book.

In Chapter 6 ("Patient Assessment"), the head-tilt and jaw-thrust maneuvers were mentioned. Both of these change the geometry of the patient's airway to prevent the patient's tongue from relaxing backwards and covering their epiglottis. Both of these maneuvers require the patient to be laying on their back.

Head-Tilt Maneuver

For patients without a suspected head or neck injury, medics should use the head-tilt maneuver (sometimes called the head-tilt/chin-lift maneuver). This maneuver is potentially dangerous in patients with an injury to the cervical spine as the movement may cause damage to the spinal cord. To perform this maneuver, place one hand on the patient's forehead and another on the bottom of the patient's chin (Figure 11.11). Push down and back on on the forehead while simultaneously lifting the chin.

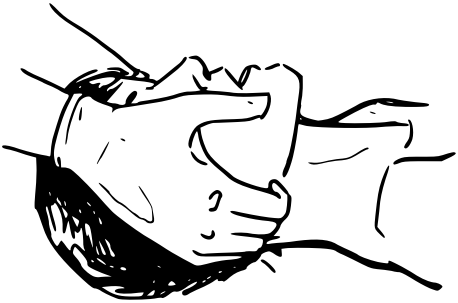
Figure 11.11: Head-Tilt Maneuver[71]



Jaw-Thrust Maneuver

For patients with a suspected head or neck injury, medics should use the jaw-thrust maneuver. In some cases, this maneuver is not sufficient to open the airway, and medics may need to use the head-tilt maneuver. To perform the jaw-thrust maneuver, position yourself above the patient and place both hands on the sides of the patient's head (Figure 11.12). Raise the jaw by hooking your fingers on the mandible (jaw bone) where it bends and lifting up. Ensure your fingers do not compress the soft tissue of the patient's throat.

Figure 11.12: Jaw-Thrust Maneuver[71]



Using Ventilation Devices

Artificial ventilation is done by using a device to maintain BSI while you ventilate your patient. Devices ventilate a patient's lungs with air from the environment or by using the air from a medic's own lungs. Using air from one's own lungs to ventilate a patient is called expired air resuscitation.

It should be noted that all ventilation devices may have reduced effectiveness for patients with significant amounts of facial hair. The presence of facial hair may inhibit the mask's ability to create an airtight seal on their face. You should remove the patient's glasses before beginning artificial ventilation to make it easier to place the mask. It may be impossible to use a mask or perform artificial ventilation on patients with significant maxillofacial trauma.

Using a CPR Pocket Mask

A CPR pocket mask (Figure 11.13), often called a pocket mask, is a plastic mask that covers a patient's mouth and nose so that a medic can exhale air into the patients lungs. Pocket masks have a filter and a one-way valve that helps maintain BSI by preventing vomit, blood, or other infectious material from entering the medic's mouth.

To use a pocket mask, remove the mask from it's container. Most pocket masks are collapsible, so ensure your mask has been expanded. If your mask has a detachable valve or tube, attach this to the mask.

The mask is directional and should be placed to cover the patient's nose and mouth as shown in Figure 11.14. It is important to get a good seal against the face. A poor seal will cause air to leak back into the atmosphere, preventing you from ventilating the patient's lungs.

A common technique for securing a pocket mask against the patient's

Figure 11.13: Pocket Mask[71]

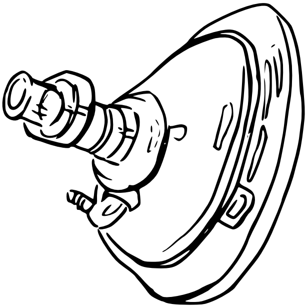
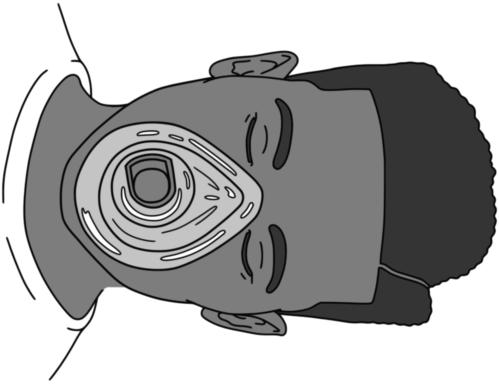
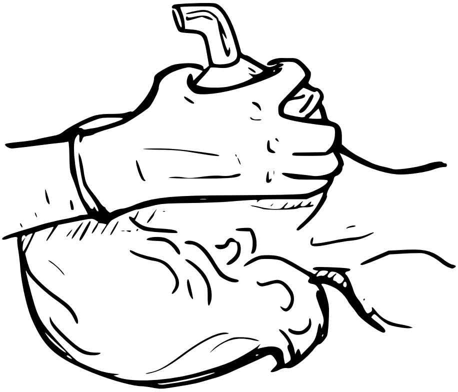


Figure 11.14: CPR Mask Placement[12]



face to achieve a tight seal is called the EC-grip (Figure 11.15). To do the EC-grip, make a "C" with your and index finger and spread your remaining fingers to make an "E." The thumb and index finger hold the mask, and the other fingers wrap around the patient's lower jaw. Do not press down on the patient's face in a attempt to get a tight seal as this will tilt their head forward and close their airway. Instead, use the EC-grip to squeeze the mask on to the patient's face, and pull the jaw up using the three fingers of the "E." You may need to use both hands to achieve a tight seal. Like with the jaw-thrust maneuver, do not compress the soft tissue of the patient's throat.

Figure 11.15: EC-Grip[71]

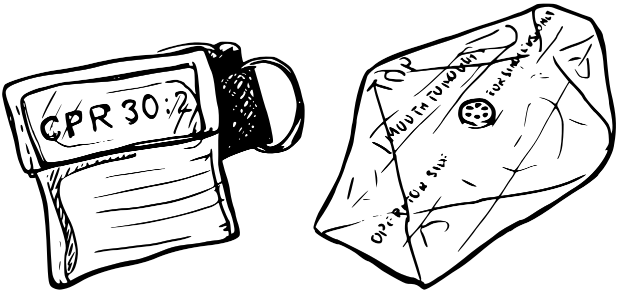


Using a Keychain CPR Mask

A smaller type of CPR mask, commonly called a keychain CPR mask, is a small, foldable sheet of plastic (Figure 11.16). Like pocket masks, keychain CPR masks have a one-way valve to help maintain BSI.

To use a keychain CPR mask, remove the mask from its pouch and unfold it. Keychain CPR masks have a one-way valve. To ensure correct placement, they have writing to indicate how they should be oriented over a patient's face. Look for writing that says "Rescuer Side" or "This side up." The masks may be asymmetric, so look for writing or arrows that say "Top" as this side needs to be placed over the patient's nose. The plastic of the mask should cover both the patient's nose and mouth. When blowing air into the patient's lungs, pressure from your mouth will be used to create a seal between the mask and the patient's skin. You will need to pinch the patient's nose to ensure that air goes into their

Figure 11.16: Keychain CPR Mask[71]

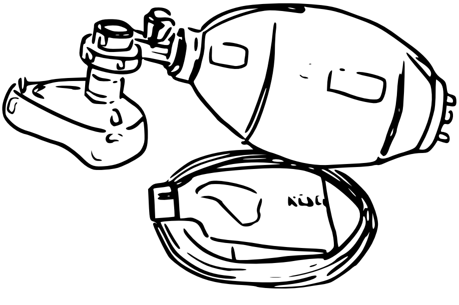


(a) Packed (b) Unpacked

lungs and not back out into the atmosphere.

Using a Bag Valve Mask
A bag valve mask (BVM), also known as an Ambu bag, is similar to a CPR pocket mask (Figure 11.17). Instead of relying on the expired air from a medic's lungs, a BVM has an attached, self-inflating bag that ventilates the patient's lungs using air from the environment. All BVMs as well as some pocket masks have valves for attaching an oxygen supply.

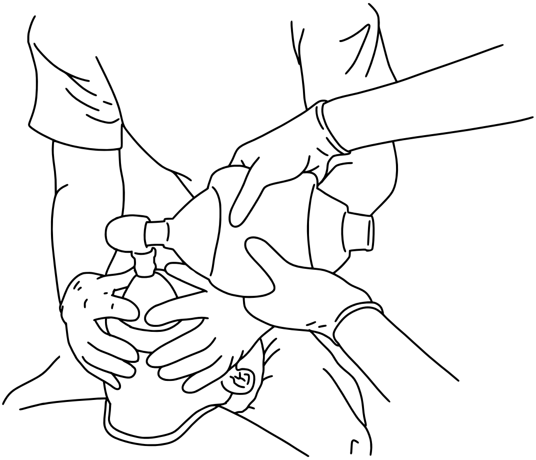
Figure 11.17: Bag Valve Mask[71]



To use a BVM, remove the it from its pouch, expand the bag, expand the mask, and connect the components. Position the BVM on the patient's face and secure it using the EC-grip following the same steps as when using a CPR pocket mask.

Use of a BVM requires two medics who are trained in BLS. One medic positions themself over the patients head and the other positions themself next to the patient. The medic above the patient's head holds the BVM in place and actuates the bag. During CPR, the medic next to the patient performs chest compressions. If achieving a seal is difficult, the first medic holds the BVM in place with both hands, and the second medic actuates the bag (Figure 11.18).

Figure 11.18: BVM Use with Two Medics[12]



Steps for Artificial Ventilation

If the patient is in respiratory arrest, they need artificial ventilation. For adults, ventilations should move 500 mL of air into the patient's lungs at a rate of 12 ventilations per minute, or 1 ventilation every 5 seconds.

Call EMS. If emergency medical services are available in your region, call EMS using the steps covered in Chapter 6 ("Patient Assessment").

Preparation. Before you begin, prepare your ventilation device, and position it over the patient's nose and mouth. If you are the only medic, position yourself beside the patient. If there are two medics, position one beside the patient and one above the patient's head. The medic above the patient's head is the leader and issues commands.

Ventilation volume. When ventilating a patient, ventilate 500 mL into the patients lungs. This is approximately the volume of air that causes a slight chest rise. Over-inflating the lungs can damage them, but a more immediate risk is forcing air into the stomach. This can cause the patient to vomit. The vomit may be inhaled into their lungs or block their airway.

Ventilation rate. Twelve ventilations should be delivered per minute, or 1 every 5 seconds. Be cautious of ventilating patients more quickly than this rate. If you are nervous or pumped up on adrenaline, your own breathing rate may be elevated, and you may be tempted to match your patient's respiratory rate with yours. To ensure you are ventilating at the appropriate rate, you should count out loud. For an adult, ventilate the patient once, say out loud "One one-thousand, two one-thousand, three one-thousand, four one-thousand" then ventilate the patient again.

Check ABCs. Check the patient's ABCs every 2 minutes or every 24 ventilations to ensure they still have a pulse or to see if they are breathing on their own. If the patient is in cardiac arrest, begin CPR. If they remain in respiratory arrest, continue artificial ventilations.

Consider airway obstructions. During artificial ventilation, and especially during the first ventilations, you may find that that patient has an obstructed airway. If the first ventilation cannot reach the patient's lungs, reposition the their head and attempt a second ventilation. If this ventilation cannot reach their lungs, their airway may be obstructed. Look for and remove obstructions. If none are found, continue artificial ventilations.

Position patient in rescue position. Once a patient has a return of spontaneous respiration, roll the patient on to their side into the rescue position.

Monitor ABCs. Continuously monitor the patient's vital signs until they regain consciousness or advanced medical care arrives and takes over.

Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation (CPR) is a medical procedure that uses chest compressions and artificial ventilation to circulate oxygenated blood to preserve brain and organ function (Figure 11.19). The goal of chest compressions is to compress the chambers of the heart to force blood through the arteries (Figure 11.20). Specific procedures for one medic, two medics, and two medics with an AED follow.

It is important to remember the phrase "time is brain" meaning that time wasted equals permanent loss of brain function. Steps that delay delivering CPR such as preparing a manual suction pump or cutting away a patient's clothing should not take precedence over delivering chest compressions.

Figure 11.19: Basic Life Support Flowchart

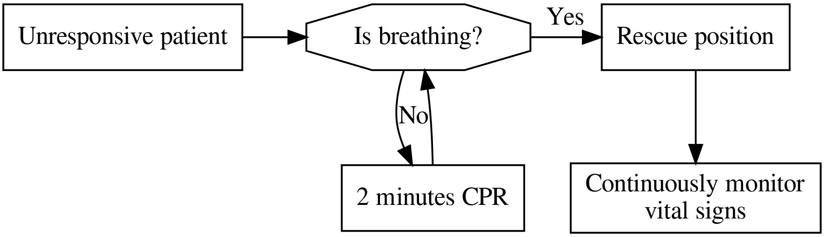
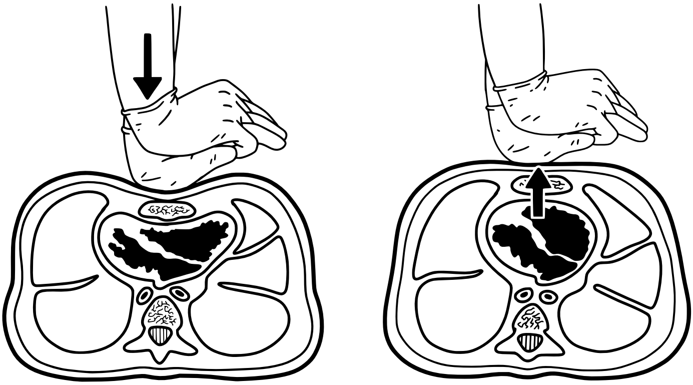

Unresponsive patient
Is breathing?
Yes
Rescue position
No
2 minutes CPR
Continuously monitor vital signs

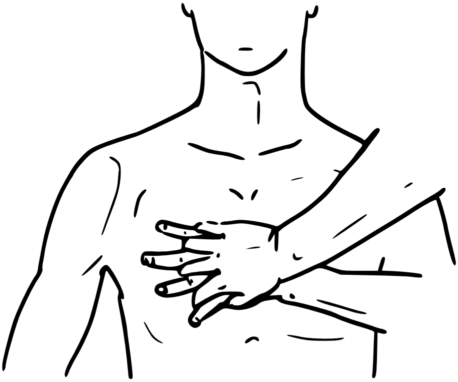
Figure 11.20: Heart Compression[12]



CPR rate. Thirty chest compressions should be done for every two ventilations, and vitals are rechecked every two minutes. Chest compressions are done at a rate of 100 to 120 per minute.[ii] This is approximately 6 cycles of compressions and ventilations per two minutes. Count your compressions out loud, and for each cycle, say the cycle's number out loud. For example, start with "One, two, three" on the first, "Two, two three" on the second, and so on. Ventilate 500 mL of air into the patient's lungs in quick succession with a one second pause between the two ventilations.

Compression mechanics. To place your hands for chest compressions, find the xiphoid process at the end of the patient's sternum. Use two fingers to measure a space above the xiphoid process, and then place the heel of your hand on the sternum. Place your other hand on top of your first and interlock your fingers. Figure 11.21 shows proper hand placement. Each compression should be done to a depth of 5 to 6 cm. Keep your elbows locked to ensure the chest is properly compressed and that you don't quickly fatigue yourself. While delivering compressions, you may hear cartilage popping or ribs breaking. This is normal, and it is not a sign that you should stop CPR.

Figure 11.21: Chest Compression Hand Placement[71]



Updates to CPR

If you have learned CPR before, the procedures may have changed as new research shows what is actually effective in the field. The major change to CPR since you have last learned it is that it is safe to assume that a patient who is not breathing does not have a pulse. Checking for a pulse is difficult, and a patient who is in respiratory arrest will quickly enter cardiac arrest. This is omitted in modern CPR.

[ii] The song *Stayin' Alive* by the Bee Gees is 104 BPM. You can match your rhythm to the lyrics from the refrain to assist with pacing.

Additionally, chest-compression-only CPR is still effective. If you do not have a ventilation mask, perform compressions without ventilation.

CPR With One Medic

The following is the procedure for CPR with one medic. Untrained volunteers are not helpful with CPR itself, but they can be directed to assist with other tasks.

Call EMS. If emergency medical services are available in your region, call EMS using the steps covered in Chapter 6 ("Patient Assessment").

Preparation. Position yourself beside the patient. Prepare your artificial ventilation device and place it beside the patient. If you have a manual suction pump, do not prepare it until it becomes necessary.

Remove clothing. If clothing would impede deliver of chest compression of constricts the patient's chest, remove all clothing from the patient's chest. Use trauma shears to cut away clothing, possibly including the patient's bra.

Begin CPR. Deliver chest compressions and artificial ventilations as described above for two minutes.

Check for breathing. Every 2 minutes, check to see if the patient is still breathing. If the patient is not breathing, continue CPR. Do not attempt to check for a pulse as this may be time consuming and difficult if their pulse is weak.

Position patient in rescue position. Once a patient has a return of spontaneous respiration, roll the patient on to their side into the rescue position.

Monitor ABCs. Continuously monitor the patient's vital signs until they regain consciousness or advanced medical care arrives and takes over.

CPR With Two Medics

CPR with two medics follow the same general procedures as CPR with one medic. The main difference is that one medic performs compressions and the other performs artificial ventilations.

Begin chest compressions. Medic 1 positions themself next to the patient and immediately begins delivering chest compressions.

Call EMS. While Medic 1 delivers chest compressions, Medic 2 calls EMS or directs someone to call EMS. Medic 2 may dial EMS themself then direct a bystander to hold the phone on speakerphone in order to free their hands.

Prepare devices. While on the phone, Medic 2 prepares the artificial ventilation device then, if applicable, the manual suction pump.

Begin CPR. Medic 2 positions themself above the patient's head. Medic 2 is now the leader and issues commands to Medic 1. Medic 2 is responsible for tracking the CPR cycles. After every 30 compressions, Medic 2 delivers two artificial ventilations to the patient. In order to signal that Medic 2 should ventilate, Medic 1 should count aloud starting on the 25th compression.

Switch positions. Medic 1 may signal that they are tiring and need to switch with Medic 2. After their 30th compression, Medic 1 should say aloud "Switch." Medic 2 delivers the scheduled two ventilations, then moves beside the patient and begins chest compressions. Medic 1 moves to the head of the patient and becomes the leader.[iii] It is recommended to switch every two minutes while one medic checks for breathing. This prevents a medic from getting tired and delivering improper chest compressions.

CPR With Two Medics With an AED

An AED (automated external defibrillator, Figure 11.22) is a portable medical device that can diagnose shockable rhythms and treat them via defibrillation. AEDs are designed to be so simple to operate that an untrained person can correctly use one.

Procedures for CPR with two medics with an AED follow closely to CPR with two medics and no AED. The main addition is that the medic at the head of the patient (in the previous example, Medic 2) operates the AED.

Prepare the AED. Medic 1 begins immediately delivering chest compressions, and Medic 2 prepares the AED before preparing the ventilation device or manual suction pump. Medic 2 turns on the AED and applies the electrodes to the patient's chest (Figure 11.23). If the patient has chest hair, Medic 2 should use a disposable razor to clear away chest hair before attaching the electrodes. If the patient is wet, Medic 2 should dry them to avoid the AED shocking other medics or bystanders.

Relay instructions. As the leader, it is the responsibility of Medic 2 to relay instructions from the AED to all other medics.

[iii] Despite the fact that in this example Medic 1 is the one issuing the switch command, Medic 2 is still the leader with regards to CPR and treatment. It is important to follow this protocol as you will see in the section about CPR with an AED.

Figure 11.22: AED[12]

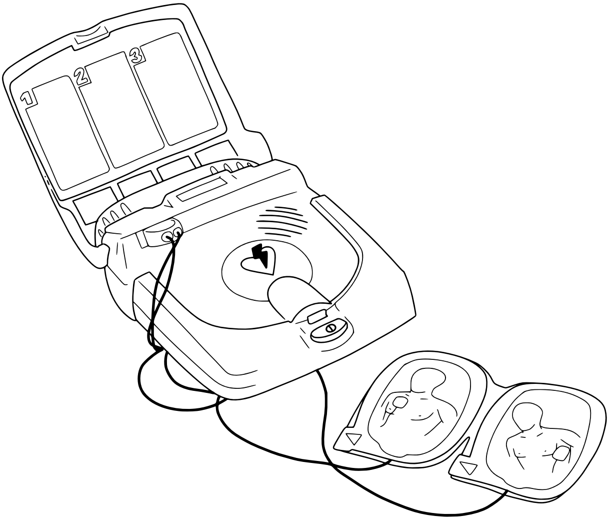
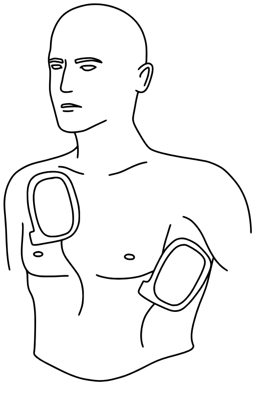


Figure 11.23: AED Electrode Placement[12]



Ensure medic safety. The medic at the patient's head (Medic 2) has an overview of the entire patient. It is their responsibility to ensure all other medics have backed away from the patient before delivering shocks to the patient.

Switching. When medics switch who delivers compression and who delivers ventilations, the medic who has moved to delivering ventilations takes over operating the AED. The medic delivering ventilations becomes the new leader.

Example AED Steps

AEDs may differ in their exact steps, so it is important to listen to the instructions for your model. Typical AED usage is a follows:

1. Open the AED case and turn on the AED.
2. If applicable, shave body hair from the patient and dry the patient.
3. Open the electrode case and attach them to the patient's chest.
    - The electrodes are labeled with their positions.
    - One electrode is placed on the right pectoral muscle.
    - One electrode is placed on the lower, outer part of the left ribcage.
4. Plug the electrodes into the AED.
5. Press the "Analyze" button.
6. Wait for the command that says "Analyzing. Do not touch the patient."
    - Stop delivering ventilations and chest compressions.
    - All medics should lean back and hold both hands up to signal they are clear.
7. Wait for the AED to give a command like "Shock recommended. Charging."
8. Perform CPR while the AED charges its capacitor. It may emit a continuous tone with increasing pitch.
9. Listen for the AED to say "Shock ready. Stay back."
10. Loudly say "Clear!" and wait for all medics to lean back and raise their hands.
11. Press the "Shock" button.
12. Immediately continue CPR.
13. Listen for further instructions from the AED. It will likely recommend CPR and provide a timer and may provide a metronome for compressions.

Continue cycles of CPR and shocks until the patient has a return of spontaneous respiration or you are relieved by advanced medical personnel.

Summary

The flowchart in Figure 11.19 summarizes procedures for delivering artificial ventilations and performing CPR on a patient. If the patient is not breathing, ventilate the patient at a rate of one ventilation at 500 mL every 5 seconds, checking the ABCs every 2 minutes or after 24 ventilations. If the patient has no pulse, deliver cycles of 30 compressions and 2 ventilations, compressing the chest approximately 5 cm at a rate of 100 to 120 compressions per minute. Check to see if the patient is breathing every 2 minutes, or after 6 cycles of compressions and ventilations. When the patient is breathing on their own (return of spontaneous respiration), roll the patient into the rescue position and continuously monitor their vitals.

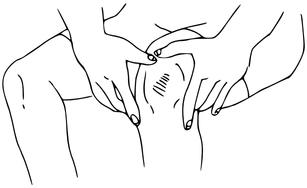
Time is brain. Begin CPR quickly, and do not faff about preparing equipment.

12 : Wound Management

> In Egyptian mythology the eye of Horus was an ancient symbol of protection and power to ward off evil. I should hope that my eye can become a beacon of hope that supports Hong Kongers to ward off evil.
>
> Anonymous Hong Kong Medic[78,i]

Treating wounds is what people often think of when they hear the words “first aid.” Sometimes wound management is as simple as putting ice on a bruise or stopping minor bleeding on a finger. At an action, these injuries may be caused by accidents, but often they are caused by State violence against protesters. Much of your work as a medic will be treating wounds, and while this book teaches you the basics of bandaging wounds, you will still need to practice with others.

Figure 12.1: Abrasion Example[79]



Physiology

The skin is composed of two layers (the epidermis and dermis) with subcutaneous tissue beneath the dermis. The epidermis is the outermost layer. It is thin and has no blood vessels. The epidermis protects the body from pathogens and regulates water loss. The dermis is the next

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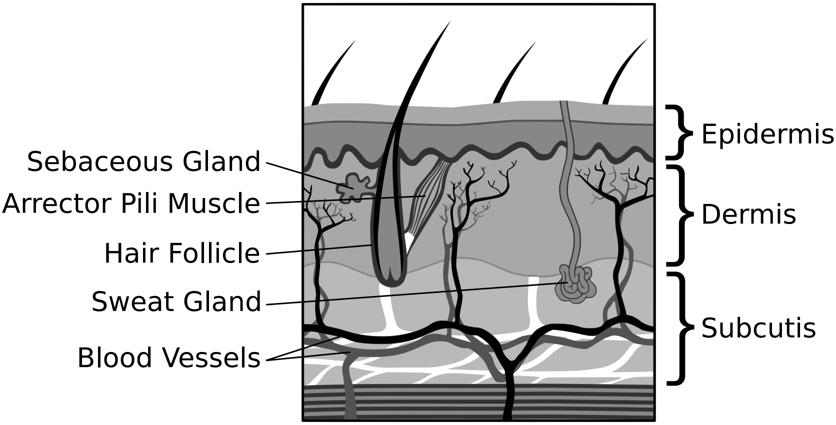
[i] On August 11th, 2019, a medic had her eye shot out by a bean bag round fired by police during the anti-ELAB protests in Hong Kong. Her injury became a symbol for her fellow protesters leading to demonstrations in support of her. This quote was from her first public statement after her injury.

layer down. It is composed of dense connective tissue and cushions the body. The dermis also houses blood vessels, nerves, hair follicles, sweat glands, and sebaceous glands (oil glands) among other structures. Below is the subcutaneous tissue that attaches the skin to the underlying bone and muscle. It is 50% fat and contains more nerves and blood vessels than the dermis. See Figure 12.2 for a cross section of the skin.

Figure 12.2: Skin Cross Section[33]



Hemostasis is the process of stopping bleeding through natural or artificial means. The human body naturally maintains hemostasis while bleeding through vasoconstriction and the coagulation of blood. If a patient is hemorrhaging, their body may not be able to achieve hemostasis before they die of blood loss (exsanguination).

Wound Classification

Traumatic wounds can be divided into blunt force trauma and penetrating trauma. As the name suggests, penetrating trauma is caused by an object penetrating the body such as a puncture from stepping on a nail, a knife wound, or a gunshot wound. Blunt force trauma is caused by impact such a being struck by a fist or police baton. Wounds are also classified as either open or closed based on whether or not the skin was broken.

Closed Wounds

Closed wounds come in two main varieties: hematomas and crush injuries. Internal bleeding is also a closed wound, such as bleeding following a bone fracture of damage to the lungs. Treatment for internal bleeding is covered by the chapters relevant to the original injury.

Hematomas

A hematoma is a collection of blood outside of the blood vessels. This may be pooling of blood in a body cavity or space between two tissues such as between the dermis and a finger or toenail. Hematomas may form at the site of an injury or blood may move under loose tissue such as in the case blood pooling in the foot beneath the skin following a sprained ankle.

A contusion, more commonly known as a bruise, is a type of hematoma characterized by the leakage plasma or blood into the surrounding tissue caused by damaged capillaries.

Hematomas and contusions are characterized by localized pain, swelling, and discoloration.

Treatment

Apply ice or a cold-pack to minimize swelling. Check for fractures beneath the bruises. With more painful hematomas, a limb may need to be immobilized to minimize pain.

After the first 12 hours, the patient may use warm compresses on a hematoma to increase blood flow and facilitate reabsorption of fluid from the tissues. For some large hematomas, a patient may need to have the blood drained by advanced medical care.

Crush Injuries

Crush injuries are caused by compression of the body and are often the result of automobile accidents or building collapse. They may be accompanied by other traumatic injuries on or near the site of the crush injury itself. Crush injuries can cut off circulation to body parts and cause massive damage to muscles. The breakdown of damaged muscle tissue (rhabdomyolysis) can release toxins into the blood. Complications include hypovolemic shock, compartment syndrome, acute renal failure, and cardiac arrest.

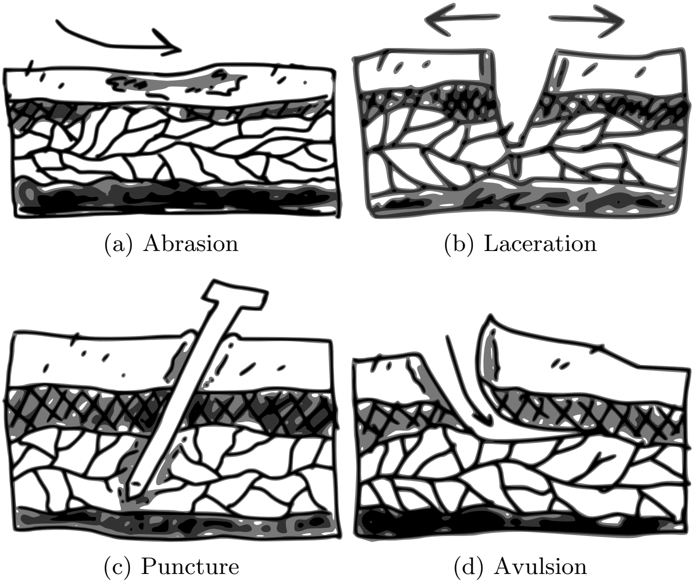
Treatment

Crush injuries to the distal end of an extremity may not be life-threatening, but prompt medical care is required to retain use of the limb. Other crush injuries, especially to the upper leg, are medical emergencies. In all cases, check the patient's ABCs, control bleeding, and treat for shock. Evacuate the patient to advanced medical care.

Open Wounds

Open wounds are classified according mechanism of injury.

Figure 12.3: Open Wounds[79]



(a) Abrasion

(b) Laceration

(c) Puncture

(d) Avulsion

Abrasions. Abrasions are superficial wounds where the epidermis is scraped off. An abrasion is commonly called a scrape, road rash, or rug burn. Abrasions bleed minimally or not at all. Abrasions heal faster when they are kept moist with an antibacterial ointment and covered with a dressing.

Incisions and lacerations. Incisions are wounds caused by cutting by a sharp object such as a knife or glass. The edges of an incision are straight. Incisions are often miscategorized as lacerations.

Lacerations are wounds that are caused by tearing of the skin by blunt force trauma such as skin splitting after being hit by a baton of after falling on pavement. The edges of a lacerations are jagged.

Incisions and lacerations may be relatively superficial or may penetrate all the way to muscle or other underlying tissue. Incisions and lacerations require sutures (stitches) from advanced medical care if they are long or deep enough to cause the skin to gap. Sutures are also recommended for cosmetic reasons[ii] and in order to help retain full function if the injury is located on the hands, feet, or face.

Puncture wounds. A puncture wound is a wound caused by an object piercing the body such as a nail or sharp piece of wood. Puncture wounds may bleed only minimally due to the object acting as a plug. However, deeper tissues and organs may be damaged including major arteries or veins.

Impaled objects should be left in place and stabilized with gauze until they can be removed by advanced medical care. If the impaled object is loose enough to fall out on its own or if it prevents transport, it may be removed. Impaled objects to the cheek, face, or neck that cause airway obstruction may need to be removed to allow the patient to breathe or to facilitate CPR.

Avulsions. An avulsion is the tearing away of a body part. This may nearly amputate an entire limb or create a flap of skin as tissues tear along anatomical planes such as between subcutaneous tissue and muscle. Small avulsions may be treated by cleaning the wound, including under the skin flap, and repositioning the skin before bandaging it. An avulsion larger than 5 cm in diameter may require a skin graft to heal. Patients with large avulsions should be evacuated or sent to advanced medical care.

Degloving. Degloving is a type of avulsion where a large piece of skin is torn off the underlying tissue. The name reflects the appearance of the injury which resemble a glove being pulled off a hand. Jewelry such as rings and bracelets can get caught when using one's hands and tear back large amounts of skin.[iii]

Amputations. An amputation is the complete severance of a body part, usually an extremity. Amputations of an extremity may sever a major artery and cause severe bleeding. However, the tissues of the

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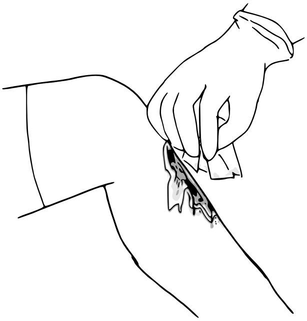
[ii] When advanced medical care is recommended on cosmetic grounds, it should be noted that the recommendation comes not as a means of promoting a singular type of universal beauty. It is mentioned so that you can inform the patient that failure to seek additional care may lead to a permanent and obvious change to their appearance. This is something they may not want, or they may not care. It is your duty to inform them of this possibility so that they may make their own decision.

[iii] This is why medics (and everyone, for that matter) are suggested to remove jewelry (especially on the hands) before an action.

Figure 12.4: Avulsion Example[79]



stump itself may only bleed minimally as the blood vessels contract. Use of a tourniquet may be necessary to control bleeding.

Hemorrhage Classification

A classification system for hemorrhage can be found in Table 12.1. This table assumes the patient has the average 5 L of pre-injury circulating blood. These values are not absolute since patients respond differently to blood loss.

Class I hemorrhage may be managed without fluid resuscitation and is not often accompanied by changes to vital signs. Class III hemorrhage is approximately when hypovolemic shock occurs.

Table 12.1: Hemorrhage Classification Based on Estimated Blood Loss[80]

	Class I	**Class II**	**Class III**	**Class IV**
Blood loss (mL)	< 750	750–1500	1500–2000	> 2000
Blood loss (%)	< 15	15–30	30–40	> 40
Heart rate (BPM)	< 100	100–120	120–140	> 140
Blood pressure	Normal	Normal	Decreased	Decreased

Estimating Blood Loss

To help you estimate if a patient has a Class II or above hemorrhage, the following can be used as references. Using these estimations can help you determine if the person needs immediate evacuation to advanced medical care due to blood loss.

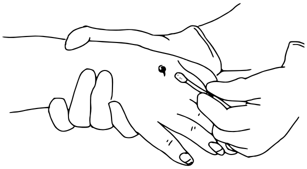
A pool of blood on a hard surface that is 50 cm in diameter is approximately 500 mL. Pools that are 75 cm and 100 cm in diameter are approximately 1000 mL and 1500 mL respectively. One-third of the front of a T-shirt that is soaked (not just wet) with blood is approximately 250 mL.

Another method for estimating blood loss is the MAR method.[81,iv] Hold your closed fist just above the pool of blood. The area beneath is approximately 20 mL of blood. The amount of blood under your fist is higher on dirt or carpet than a smooth surface. Using this method, the upper limit of Class I hemorrhage on a smooth surface is 36 fists worth of blood.

Treatment

Treating open wounds consists of controlling bleeding, cleaning the wound, and dressing the wound. Open wounds carry risk of infection, so patients will have to be aware of the signs so that they may seek advanced medical care on their own.

Figure 12.5: Puncture Wound Example[79]



Remember to practice good BSI. Always wear examination gloves to prevent coming into direct contact with a patient's bodily fluids. You may need to wear eye and face protection when treating patients who are severely hemorrhaging.

Control bleeding. Controlling bleeding is the first step to treating an open wound. Patients who are bleeding from an artery may die within minutes if bleeding is not controlled. Arterial bleeding is characterized by blood that spurts with each heartbeat whereas venal and capillary bleeding has a regular flow. Patients may have arterial bleeding without spurts if the artery itself is not exposed such as in a stab wound.

Additionally, minimizing blood loss also helps calm both patients and bystanders as many people are sensitive to the sight of blood. A pool of blood or large amounts of blood splatter may cause the patient or bystanders to panic or faint.

[iv] MAR is an acronym of the authors' names.

Apply direct pressure. Place gauze over the wound, and use your hand to apply pressure directly to the wound. Pack large wounds or gaping wounds with gauze before applying pressure. Wounds with arterial bleeding may need to be packed with hemostatic gauze in order to rapidly induce hemostasis.

In absence of gauze or proper dressings, a bandana or other cloth may be used as a dressing. Use of improvised dressings carries increased risk of infection. They are not recommended except in emergencies. If no dressing are available, apply pressure with just your hand.

If the wound bleeds through the dressing, place additional dressings over the original dressing. Removing the original dressing may disturb a clot that is forming and slow the clotting process.

Elevate the wound. If there are no complicating or painful injuries such as fractures or soft tissue damage that would be exacerbated by movement, elevate the limb above the heart.

Use a pressure dressing. Using a pressure dressing will free you to attend to other injuries, begin basic life support, or move on to other patients. Pressure dressings can be purchased (combat dressing), or they can be improvised using basic medic supplies.

It is important to keep pressure on the wound while applying a pressure dressing. Additionally, pressure dressings should not be tied too tight that they act as a tourniquet and cut off blood flow below the injury. Pressure dressings should only be used on extremities as using them on the torso can inhibit respiration and use on the neck can cut off blood flow to the brain.

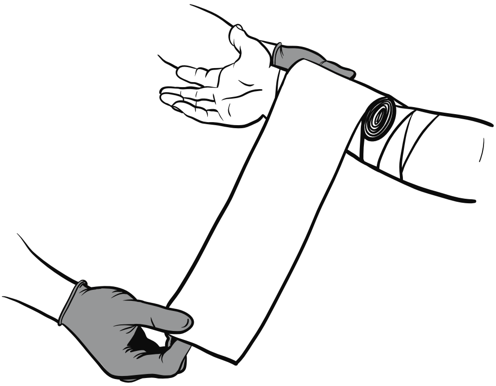
To create a pressure dressing (Figure 12.6), place a bulky dressing (a thick gauze pad or a rolled up gauze roll) directly over the wound. Use a gauze roll or folded triangle bandage wrapped around the extremity to secure the bulky dressing in place. Ensure that when wrapping the extremity, the bulky dressing is fully covered so it cannot slip out. Tie a knot directly over the wound.

To tie a knot using a gauze roll, tear the gauze lengthwise down the middle. Wrap each half in opposite directions around the extremity so they meet directly over the wound. Tie a knot. Using medical tape to affix the gauze will not provide nearly as much pressure as tying a knot.

Occlude arterial blood flow. If pressure and elevation are not sufficient to stop blood flow, you may need to occlude arterial blood flow by using pressure points or a tourniquet. These two topics are discussed in their own sections later in this chapter.

Clean the wound. Once the bleeding has stopped, you will need

Figure 12.6: Pressure Dressing[82]

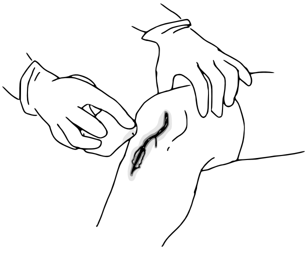


to clean the wound to prevent infection. Flush the wound using water, saline, or specialized wound irrigation solution. If you have an irrigation kit, use the syringe to irrigate the wound. Spray water directly into the wound with enough pressure to dislodge debris.

If you do not have a irrigation solution, use tweezers to remove debris and dead tissue. If you do not have tweezers, use dry gauze to remove debris and debride (scrape away) the dead tissue. Flush the wound again after cleaning.

You may need to control bleeding again as cleaning may dislodge recently formed blood clots.

Figure 12.7: Laceration Example[79]

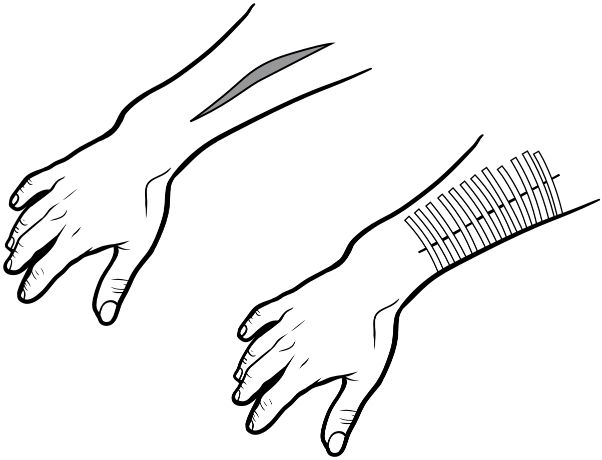


Dress the wound. Apply antiseptic cream or spray to the wound, then cover it with fresh dressings. Use a fresh dressing to cover the wound, and secure it in place using rolled gauze, tape, or a net dressing.

When securing the dressing, ensure you have not blocked blood flow to an extremity. Check the patient's CSM.

Apply wound closure strips. If the wound is gaping and no longer bleeding, you can close the wound using wound closure strips (Figure 12.8). Wound closure strips are thin strips of porous medical tape used to hold minor wounds closed. Ideally this wound be done by medical professionals, but such care may not be available. Note that if you use wound closure strips, the wound must first be fully cleaned and irrigated to prevent infection.

Figure 12.8: Wound Closure Strip Application[82]



To apply wound closure strips, first clean and dry the area surrounding the wound. Remove one strip from the package and press it on to the skin on one half of the wound. Using your other hand, pinch the wound together to close it, then press the remaining half of the strip against the skin on the other side of the wound. Every 3 mm, repeat this process to fully close the wound. Optionally, after closing the wound, place additional strips parallel to the wound to reduce tension. If possible, cover with Tegaderm or similar transparent film dressing; this will help secure the wound closure strips in place, while still allowing visual inspection of the wound.

Consider treating for shock. Patients who have traumatic injuries or significant blood loss may panic and go into shock. Patients with significant blood loss should be treated for shock, and other patients may need to be monitored for shock depending on the severity of their wounds.

Locate amputated body parts. Amputated body parts may be surgically reattached. After attending to the patient, find the amputated body part and clean it with water or saline. Wrap the body part with moist (not wet) gauze. Place the wrapped body part in a plastic bag, and place it in cold water or atop ice. Do not bury the body part in ice, submerge it in ice-water, or let it come in direct contact with ice (even through a plastic bag). Ensure the body part accompanies the patient to advanced medical care.

Occluding Arterial Blood Flow

Severe hemorrhaging may need to be treated by directly occluding arterial blood flow. Two methods for doing this are use of pressure points and use of tourniquets. These methods may be combined. For example, one medic may immediately apply pressure to a pressure point while a second medic prepares and applies a tourniquet.

Pressure Points

Pressing directly on an artery proximal to the heart will reduce blood flow and slow bleeding. Figure 12.9 shows a subset of pressure points. Use of pressure points should be limited to 10 minutes due to the risk of complications. Bleeding that requires use of a pressure point is serious enough to require advance medical care.

Tourniquets

A tourniquet is a device that applies external compression to stop blood flow, but their use is not without risk. If you apply a tourniquet, you must not remove it. You must get the patient to advanced medical care. Use of a tourniquet can cause rhabdomyolysis, and releasing the tourniquet can cause acute renal failure. This is a life-threatening medical condition. Thus, use of tourniquets should be used as a last resort.[v]

When applying a tourniquet, if you only apply enough pressure to occlude blood flow in the veins but not the arteries, the hemorrhage will worsen. This is because there will be enough blood pressure for blood to flow through the arteries to the wound but not enough for the blood to escape. It is critical to get enough pressure.

To apply a tourniquet (Figure 12.10), wrap the strap around the extremity immediately proximal to the wound and pull the strap snug. Use

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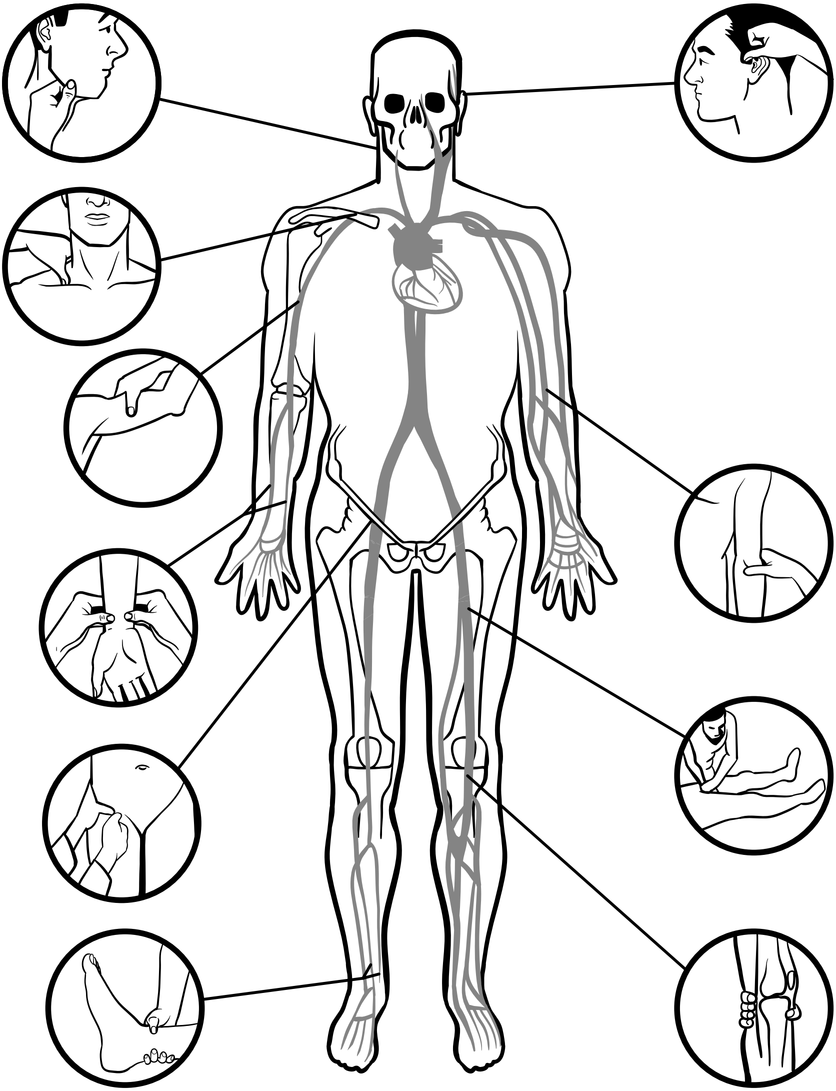
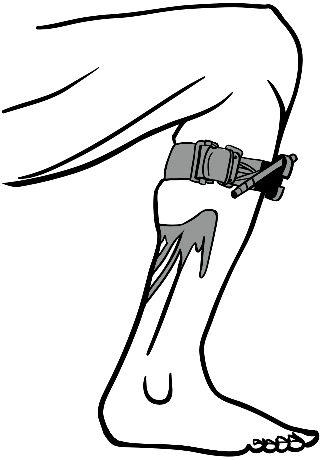
[v] This is especially true if there is risk of arrest at hospitals of in regions without affordable healthcare. Putting a tourniquet on a patient and forcing them to go to a hospital is potentially thrusting financial burden or increased risk of arrest on them.

Figure 12.9: Pressure Points[82]



the windlass to increase the pressure until the bleeding stops. Tourniquet application is painful to the patient, but you must keep tightening it until the bleeding stops. A rule of thumb is one complete rotation beyond when the patient winces from pain.

Figure 12.10: Tourniquet Application[82]



Patients may try to remove tourniquets because of the pain caused by the pressure of the tourniquet and the dying muscle tissue. This is especially true in a mass casualty incident where you may need to apply a tourniquet and move to another patient. Explicitly tell them that removing the tourniquet is life-threatening, and consider instructing one of their comrades to prevent them from doing so.

Urban Legends

Because of historic use and misunderstanding, some medics use wound treatments that are potentially harmful and are not backed by science. The following are listed for educational purposes along with explanations for why they are not permissible treatments. None of these treatments should be used on patients.

Hydrogen peroxide is a historic method of disinfecting wounds, and it remains a popular treatment for wounds. Using hydrogen peroxide on a wound causes tissue death that slows wound healing and increases scarring.[83] Do not use hydrogen peroxide to clean or disinfect a wound.

Remedies for hemorrhage control that are frequently used by street medics, preppers, survivalists, and even laypeople are black pepper (Piper nigrum) and cayenne pepper (Capsicum annuum). These are put directly into the wound either as a powder or by treating gauze with powder and then using the gauze to pack or cover wounds. Proponents of these remedies have different theories about why these remedies work ranging from cauterization from the "heat" to increased adrenal response leading to vasoconstriction. Some theories are not based on science while others sound plausible. Regardless, neither cayenne nor black pepper have hemostatic properties. Cayenne pepper does not decrease bleeding either when ingested or applied directly to the wound.[84] Donna Di Michele, the Deputy Director of the Division of Blood Diseases and Resources at the National Heart, Lung, and Blood Institute said of this claim "I'm unaware of any scientific data to support the claim that cayenne pepper can stop bleeding."[84] This urban legend may persist in part because the marigold pepper (Piper marginatum), a pepper native to parts of South America, does have some hemostatic properties, hence its nickname the "soldier's herb."[85] All of these considerations aside, any pepper will cause a burning sensation in wounds and for that reason alone they should be avoided. If you are considering using a hemostatic agent, avoid herbal remedies and use a commercially produced medical product.

Summary

Treating closed wounds is done with ice and time. Open wounds are treated by stopping bleeding with gauze and pressure, cleaning the wound, then dressing the wound. Severe bleeding may require use of hemostatic gauze or a tourniquet. Use of a tourniquet always requires evacuation to advanced medical care. Patients can lose what appears to be a massive amount of blood before being at risk for hypovolemic shock. Attempting to estimate this can help you make a decision on whether or not they need to be evacuated to advanced medical care or simply sent home.

13 : Riot Control Agent Contamination

> Bring on your tear gas, bring on your grenades, your new supplies of Mace, your state troopers and even your national guards. But let the record show we ain't going to be turned around.
>
> Ralph Abernathy[86]

Riot control agents (RCAs) are less-lethal chemical agents used by law enforcement to incapacitate protesters and disperse crowds. RCAs are often lachrymators (agents that cause tear production in the eyes), some of which cause a strong feeling of burning on the skin and mucous membranes. RCAs cause irritation to and inflammation of mucous membranes such as the eyes, nose, mouth, and lungs. Some RCAs are designed to irritate the skin, though all may have this effect in high enough concentrations. RCAs are deployed by aerosolizing or vaporizing the agent or by spraying or shooting it directly onto targets.

As incapacitants and means of crowd dispersal, RCAs are highly effective. Your ability to provide rapid treatment for RCA contamination helps enable individuals to keep protesting, and your very presence as medical support shows that even as individuals face repression that there is support to take care of them.

Use of RCAs is not just limited to police and the State. Depending on your region, fascists may carry and even frequently use pepper spray against protesters. Even during relatively minor actions that are liberal and peaceful in nature, there may be risk of RCA contamination.

RCAs are designed to cause intense pain and discomfort, so beyond the medical concerns, patients may be panicked as a result of contamination, especially if it is their first time being contaminated with RCA. Large crowds that panic may lead to secondary injuries as people run to escape and injure themselves or others. It is recommended that you preemptively work with organizations to help prevent panic when RCAs are deployed.

Among protesters and medics, tear gas and pepper spray tend to be poorly understood beyond their general unpleasantness. Medics and protesters have developed more remedies for prevention and treatment of riot control agent contamination compared to other types of injuries and illnesses. These range from questionable in effectiveness to actually harmful. This chapter attempts to clarify common misconceptions.

A Note on Gloves

One way riot medicine deviates from clinical medicine is the extent to which sterilization and sanitation procedures are followed. Body substance isolation (BSI) dictates that medics should put on a clean pair of examination gloves before touching a patient, discard them after, wash their hands, and then put on a new pair before treating a second patient. Injuries from RCAs tend to affect many protesters at once leading to a surge in patients that require treatment. To speed up treatment and prevent yourself from exhausting your supply of gloves, BSI best practices can be somewhat relaxed. If patients are not bleeding and your gloves have not come into contact with their saliva or nasal mucus, you may reuse gloves between patients. You may also chose to omit wearing gloves if a single patient only requires a quick spritz to clear minor amounts of tear gas from their eyes.

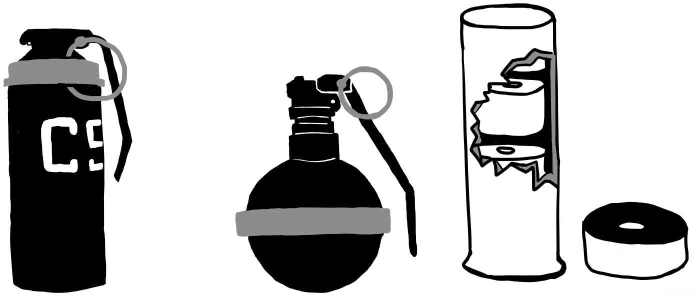
However, this does not mean you should completely disregard BSI. Before beginning treatment, you should still generally put on examination gloves. In addition to preventing the spread of transmissible diseases, gloves should be worn while decontaminating a patient to avoid spreading RCA to your skin. It is possible while decontaminating a patient to transfer enough RCA to your skin to cause a burning sensation.

Tear Gas

Tear gas is a lachrymatory RCA that is typically deployed by aerosolizing or vaporizing an irritating chemical compound. Tear gas is deployed by grenades or cannisters that are thrown, launched, or dropped by drones. Armored vehicles and aircraft (fixed-wing and rotary-wing) may spray it directly on or over crowds. Tear gas may also be mixed in with pepper spray or used as a spray on its own.

Exploding tear gas grenades as well as launched cannisters that are improperly or maliciously fired can cause injuries beyond the intended chemical irritation. Patients struck by cannisters may have thermal burns, contusions, bone fractures, lacerations, avulsions, amputations, or

Figure 13.1: Tear Gas Cannisters[9]



(a) Cylindrical Grenade (b) Spherical Grenade (c) Multi-Projectile

concussions. A hit to the torso, neck, or head can kill a protester.[i,87]

Some of most common tear gasses are listed along with their chemical names in Table 13.1.

Table 13.1: Common Tear Gasses

Name	Chemical Names
CS	2-chlorobenzalmalononitrile
CN	phenacyl chloride, chloroacetophenone
CR	dibenzoxazepine
DM	diphenylaminechlorarsine

CS is the most commonly used tear gas. Because it is so common, the literature that discusses the effects of different tear gasses typically does so by comparing their effects to CS. CN, also known as mace, is less common as it is more toxic than CS gas. CR is less toxic than CS but a stronger irritant. CR can be identified by its pale, yellow color and pepper-like odor. Patients whose skin is contaminated with CR may experience severe pain when wet, either during decontamination with water or due to sweating. DM is also known as adamsite and "green gas" due to its noticeable green color. DM's effects are similar to that of

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[i] In May of 2017 during protests against the government in Venezuela, a 20-year-old was struck in the chest and went into cardiogenic shock.[88] In October of 2018 during protests in continuation of the Great March of Return in Gaza, a 15-year-old was struck in the head.[89] In December of 2018 during Yellow Vest protests in Marseilles, an 80-year-old was struck in the face while in her home.[90] All three died of their injuries. These are not the only known cases of death by tear gas cannister.

CS. The onset of symptoms is slower, but the duration of symptoms is longer, sometimes lasting over 12 hours.

CS, CN, CR, and DM are not actually gasses. They are aerosols (a suspension of fine particles in a secondary gas). They are distributed by dissolving them in a solvent, evaporating them through thermal reaction, or turning them into a micro-powder.

Symptoms of exposure to all tear gasses are generally similar. Under low concentrations, tear gas causes a burning sensation in mucous membranes, especially the eyes. Other effects are tearing of the eyes, increase nasal mucus production, and coughing. Moderate concentrations and longer exposure lead to profuse coughing, blepharospasm (involuntary closing of the eyelid), increased salivation, difficulty breathing (dyspnea), prostration (doubling over), burning and stinging sensations on the skin, disorientation, dizziness, syncope (fainting), headache, tachycardia, and vomiting. Heavy concentrations, especially in enclosed spaces, can lead to death by asphyxiation or pulmonary edema. Patients with preexisting respiratory disorders such as asthma are more sensitive to tear gas and exposure to even small quantities can be life-threatening.

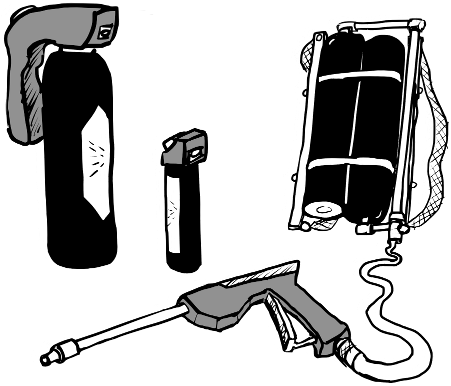
Pepper Spray

Pepper spray is a liquid that is typically sprayed into the face and eyes of individuals to incapacitate them in order to force compliance or dispersion. Pepper spray may come in watery, oily, or gel-like sprays. Some police agencies use paintball guns to shoot pepper balls at their targets' bodies for increased delivery range. Pepper spray is typically OC (oleoresin capsicum) spray.[ii] In the United Kingdom, police use PAVA (pelargonic acid vanillylamide) spray which has similar properties to OC spray.

Effects of pepper spray are a burning like pain on the skin with severe pain in mucous membranes of the eyes, nose, throat, and lungs as well as increased nasal mucus production. Even a small amount of pepper spray in the eyes causes blepharospasm. Inhalation of pepper spray or residual vapors from contaminant on the face can cause coughing leading to prostration. The most painful and severe effects of pepper spray typically abate in 15 to 30 minutes without treatment, though lingering eye watering and a sensation of burning of the skin may remain for 24 hours. Like with tear gas, patients with preexisting respiratory disorders may have life-threatening closing of their airway.

[ii] The names "pepper spray" and "mace" are generally used interchangeably, though it should be noted that historically mace referred to a CN spray that went by the name Chemical Mace.

Figure 13.2: Pepper Spray Delivery Devices[9]



Pepper spray may be blended with other RCAs like CS, CN, and CR. Because of this, some of the debilitating effects associated with these chemicals such as dizziness and disorientation may be present. Anecdotal evidence reported by patients suggests that they believe these debilitating effects are because of the "strength" and "spiciness" of the OC spray and the not addition of other RCAs.

Other Delivery Systems

Other means of delivering RCAs is via vehicle mounted water cannons. Often during protests, these cannons only use water, but they may be configured to use OC, tear gasses, dyes, or a blend of all three. Because of the volume of liquid sprayed relative to hand-held or even backpack mounted delivery systems, protesters' clothes will often be soaked with RCA. Anecdotally, protesters and medics report that OC is the preferred RCA for use with water cannons.

Protection

Typically protesters will use goggles and a half-mask respirator or disposable respirator. If these are not available, a hat, glasses, and bandana will still offer a moderate amount of protection. A wet bandana made of a fabric with a tight weave held over the mouth will filter a modest mount of tear gas from the air. A full discussion about the protective properties of different respirators and goggles can be found in Chapter 29

("Personal Protective Equipment").

Anecdotal evidence suggests that slow, shallow breaths helps minimize the effects of tear gas on the lungs. Patients have reported feeling the immediate urge to vomit after taking deep breaths in the presence of tear gas and that the feeling persisted until they were able to spend significant time breathing fresh air.

Treatment

Treatment for all RCA contamination is generally similar and involves flushing the affected body parts with large amounts of water or saline to remove the agent from the eyes, mouth, and skin. If possible, attempt to examine extinguished tear gas cannisters to identify which RCA was used because flushing skin contaminated with CR can cause a strong feeling of burning.

Both syncope and vomiting are symptoms of exposure to tear gas. Together these can lead to pulmonary aspiration followed by death via asphyxiation. You should be on the lookout for patients who appear to be unresponsive when tear gas is deployed.

Treatment Basics

The following steps should be followed for treating patients exposed to RCAs.

Introduce yourself to the patient. The patient may be blinded or disoriented, so will need to clearly introduce yourself before touching and treating them. This is true in general, but doubly so when they are alert but incapacitated. Failure to do so can lead to them striking out at you.

Remove the patient from the RCA. Pepper spray is short range and exposure happens during brief usage, but tear gas often makes air noxious for many minutes. Patients need to be moved away from tear gas before treatment can begin. Attempt to move the patient upwind from clouds of tear gas or burning cannisters. Tear gas is heavier than air, so if possible, move your patient to higher ground. In urban settings, you may be able to enter the foyer or courtyard of an apartment or office building where the air is fresher.[iii]

Remove contact lenses. If the patient has RCA on their face or eyes, they should remove their contact lenses. Flushing the eyes can push contact lenses up into the eye socket. Ask your patient if they are wearing contact lenses, and if so, direct the patient to remove them before treatment. If the patient cannot open their eyes or is incapable of removing the contacts, you may need to flush their eyes until they can open them to remove the contacts.

[iii] This likely qualifies as trespassing and this therefore illegal no matter what region you are operating in. However, police may allow medics to treat patients in these areas since they are neither a direct threat to police control nor active rioters.

Clean contact lenses. Some patients will attempt to save their contact lenses and reinsert them after you have decontaminated their eyes. You should advise them against putting the contacts back in and suggest they dispose of them immediately. However, they may have significantly impaired vision without lenses and will not be able to get home or continue participating in the action without their contacts. They may also have financial restrictions and not want to dispose of a new pair of lenses. Whatever the case may be, they may put the contacts in regardless of what you say, so your job is to help minimize recontamination and associated pain. After treatment, assist the patient with cleaning their lenses. Have them wash their hands using the solution from your bottle. Then, have them them rub their contacts together between their finger and thumb as your slowly stream water onto the lenses for at least 30 seconds. This will help remove a majority of the RCA before they put their lenses back in. After they put their lenses back in their eyes, you may need to help them gently flush out residual RCA.

Prevent the patient from touching the affected area. A patient's instinct will be to rub the affected body part, especially the eyes and face, while contaminated and after decontamination. This can make the contamination worse and spread it to other body parts. When RCAs are deployed, no one should touch their eyes at all except to remove contact lenses.

Allow tear and mucus production. If water or saline are not available, natural tear and mucus production will eventually remove the RCA. RCA on the skin breaks down and washes off over time. Even without intervention, patients will recover, albeit much more slowly.

Remove contaminated clothing. If the patient is heavily contaminated with pepper spray or tear gas, they may need to remove their clothes to prevent continued irritation. Masks and bandanas need to be removed before decontaminating the face, but other clothing can be removed after.

Decontaminate the body part. If the RCA is CR, attempt to brush and dust off as much RCA as possible. Avoid use of water or other liquids to decontaminate the patient unless they are already wet or sweaty, or the RCA is in their eyes (which are already wet).

For other RCAs, flush the body part with large amounts of water. For parts of the body other than the eyes, spraying large amounts of water on the affected body part is sufficient. Specifics techniques for decontaminating the eyes are covered later in this chapter. Because pepper spray is oily, it may be useful to gently dab or wipe the affected area with gauze to remove the bulk of the pepper spray. Vigorously rubbing and scrubbing will exacerbate the pain. During treatment for both pepper spray and tear gas, attempt to prevent runoff from spreading the RCA to other parts of the patient's body or your body, especially mucous membranes or open wounds.

Rinse the patient's mouth. Patients should rinse their mouth with water or saline to remove the RCA. Even in the absence of burning or irritating sensations in the mouth, a mouth rinse is encouraged as it helps remove the taste and it helps them feel cleansed.

Allow coughing and sneezing. If you patient is coughing or sneezing, allow them to continue as this is the body's natural response and it will help remove the RCA. Give your patient tissue or gauze, and have them blow their nose.

Use refrigerant spray. For patients who have been contaminated with pepper spray, spray the affected areas with refrigerant spray. Use of refrigerant spray does not have an effect on pain levels beyond the immediate treatment, but it psychologically helps patients feel treated. Spray the effected areas for 3 to 5 seconds. Beware the refrigerant spray with cause a burning sensation on open wounds an mucous membranes. If the patient's face was contaminated, instruct them to close their eyes and mouth and exhale slowly through their nose while your spray them.

Consider use of an inhaler. If your patient is asthmatic, remind them to use their inhaler. If you carry a salbutamol inhaler in your medic kit, consider suggesting they use it to self-medicate following the guidelines in Chapter 9 ("Medication").

Consider treating for hypothermia. Patients may remove contaminated clothing, and clothing may be wet from treatment. On cool or breezy days, this can contribute to hypothermia. Consider wrapping the patient in an emergency blanket so they do not have to put back on their contaminated clothes.

Consider other complications. Patients may appear to be generally fine when you begin treatment, but you should still pay attention to their respiratory rate and overall complexion as you treat them. Patients may develop delayed respiratory distress or hyperventilation, or they may go into shock as their adrenaline wears off. Consider treating for respiratory distress following the instructions for treating asthma in Chapter 23 ("Respiratory and Cardiac Emergencies").

Instruct the patient on how to decontaminate at home. When you discharge the patient, direct them on how to safely decontaminate when they get home.

Clothing should be removed before entering their home. Tear gas residue, especially CR, should be vacuumed off clothing and the body before entering the home. If it is available, an ultra-low particulate air (ULPA) or high efficiency particulate air (HEPA) vacuum should be used to suck up as much tear gas residue as possible. The patient should throw out the vacuum bag after use to prevent spreading tear gas.

Clothing should be washed separately from other items, twice, and with a harsh detergent. If clothing cannot be immediately washed, direct them to put it into a sealed plastic bag until they can wash it.

The patient should shower in a well ventilated room using the coldest water possible for at least 20 minutes. Warm water opens pores and may cause additional burning sensations, so patients should shower with the coldest water they can tolerate until the feeling of burning stops. Likewise, scrubbing affected areas should be avoided until burning stops.

Foyer Field Clinic - Anonymous

A few years ago we were out supporting a series of actions that ended up with repeated conflicts with the cops. In a residential area, members of the Bloc attacked the cops with Molotovs and used flaming dumpsters as battering rams. In response, the cops fired heavy volleys of CS cannisters at us. A lot of folx out at the protest weren't the usual crowd, and so they were completely unprepared and unaccustomed to tear gas. Immediately, we had tons of casualties near the front lines that we had to pick up off the ground and guide to safety.

One of the neighbors opened the main entrance to an apartment block and waved people inside to shelter. My buddy and I scooped up people and brought them into the foyer for treatment. We got about 20 people inside then closed the doors as the police started charging at the crowd.

Even in the hallway, we had to keep our respirators on because the tear gas outside was so thick. Curious folx wanted to peer through doors' windows to watch and record the action, but we pulled them back to keep them out of sight to avoid drawing police attention.

We handed out gauze to folx to use as tissues so they could blow their noses, and we worked our way through the group to rinse out eyes and mouths. One patient was on their hands and knees, vomiting and barely able to breathe. Another was having a bona fide panic attack. We gave our eyewash bottles to the protesters who were less shaken and had them treat the others, and then we each treated one of the two more unwell patients.

The neighbors brought us water to refill our eyewash bottles, and after some 30 minutes of treatment, everyone able to breath and see again. The main conflict had moved away, and when the coast was clear, we all slipped out and went on our merry ways. While it sucked that we all got gassed and some people required more than cursory treatment, it was actually a very sweet moment. Neighbors who couldn't join us on the streets helped us out, and the injured took care of each other.

There is joy to be found in the struggle.

Eyewash Techniques

Police and fascists will target the eyes with pepper spray since they the most sensitive to it and spraying it in the eyes is the most debilitating. Tear gas in the eyes generally only requires a quick flush that can even be done while on the move.

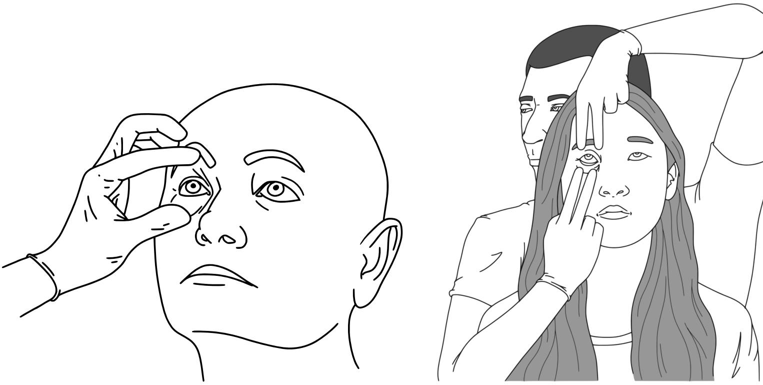
For flushing the eyes, use a pneumatic eyewash bottle, contact solution bottle, or water bottle filled with water or saline. The patient should tilt their head forward to prevent pepper spray from running into an uncontaminated eye, the nose or mouth, or down their torso. Whatever bottle you use, it should be held 2 to 3 cm from the patient's eye.

Use of spray bottles, the type used for cleaning windows or misting plants, is not recommended. In general, they do not allow the medic to spray a sufficiently high volume of water. They are relatively ineffective on the mist setting, and the stream setting will usually startle the patient into closing their eyes. Controlling the pressure of a stream from a spray bottle is difficult, and excessive spray pressure can damage the eye.

The main difficulty with flushing is the eyes is blepharospasm which prevents the patient from opening their eyes on their own. Their eyes need to be manually opened with your fingers (Figure 13.3a). Place your thumb on their lower eyelid and your index finger on their upper eyelid, and open their eye immediately before flushing it. If a second medic is available, position them behind the patient and have them use their index and middle fingers on both hands to open the patient's eye (Figure 13.3b).

A natural reaction to having liquid sprayed into the eyes is closing the eyes. Even if the patient is able to open their eyes, manually hold back their eyelids to get as much solution into their eyes as possible.

Figure 13.3: Opening a Patient's Eye[12]



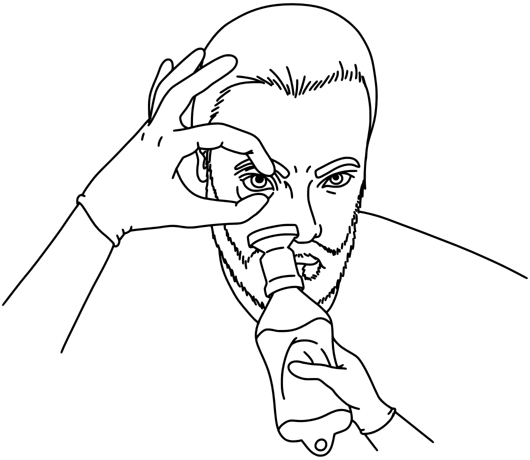
(a) One Medic (b) Two Medics

Additionally, because they may be blinded and disoriented, you will need to clearly verbally communicate exactly what you are doing to avoid startling them or having them jerk their head away as you assist them.

When flushing the patient's eyes, have the patient tilt their head forward (Figure 13.4). Spray water or saline directly into their eyes one at a time. Spray directly into their eye while directing the stream over the entire eye in small sweeping motions. Each spray should only last 1 to 2 seconds. Repeat as necessary.

A large amount of water is needed for treating pepper spray contamination, so saline vials should not be use for the initial treatment due to their low volume and the limited number you will be carrying. Using water to decontaminate the eyes leaves them feeling dry, and saline is compartively soothing, so they can be used at the end when patients have mostly recovered. Saline vials are appropriate for treating minor to moderate concentrations of tear gas as they can be handed out or quickly used for a flush.

Figure 13.4: Decontamination with a Pneumatic Bottle[12]



Treating Multiple Patients

A difficult aspect of treating patients who have been contaminated with RCA is that RCA contaminations, especially with tear gas, are short lived mass casualty incidents (MCI). You may be rapidly overwhelmed with patients, and you will need to triage patients into those most contaminated and those who can be helped second. Incidents that involve patients being pepper sprayed may include traumatic injuries from police violence. Patients who initially seem fine may degrade into respiratory distress or shock if they suffer an allergic reaction or their adrenaline wears off. As you treat multiple patients, you should be aware of the condition of patients you have previously treated.

When treating multiple patients, as in all MCI situations, you need to direct all patients to come to you. By being stationary, other people can direct patients to you, and you can monitor the status of all your patients simultaneously. Find somewhere relatively safe to treat everyone. If tear gas was deployed, this may mean moving just out of range of the highest concentrations of gas. In any case, you need to pick a location where people will not be trampled by a crowd or police charge. This may simply be backing against the wall of a building or sitting patients on a planter.

As mentioned at the beginning of the chapter, you may not have enough gloves to change them after each patient, and doing so would drastically slow down your ability to treat multiple patients. If you are working with multiple medics, split responsibilities so that some medics treat RCA contaminations and some treat traumatic injuries.

When treating multiple patients with RCA contamination, you may want to consider partially treating all patients first before making a second pass and doing a full decontamination. Doing this allows you to triage patients and assess whether anyone needs additional interventions. It is also beneficial to start with patients who have RCA in their eyes before moving to patients with RCA on their torso and extremities.

Doing an initial treatment on everyone before doing full decontaminations also reduces the total amount of panic in the group. Patients who have to wait many minutes to receive any treatment will be blinded and in pain and often say things like "Oh fuck, oh fuck, this burns so much." This spreads unease among patients and bystanders. Doing a partial rinse of the eyes may not stop the immediate feeling of burning, but it will reduce their pain levels, allow them to open their eyes some, and allow natural tear production to help flush out RCA. Most importantly, partial treatment is comforting by showing that someone is there to care for them.

No matter what ordering you have for your patients, when you move on to treat a patient, make sure you clearly communicate that you are moving to the next patient and will be back. This is especially true in panicked or blinded patients. You do not want them to feel abandoned.

Urban Legends

Because of the prevalence RCAs at demonstrations, medics have invented and deployed their own homegrown treatments and remedies. Many of these have been shown to be ineffective, and some are actually harmful. Like when administering any medication, these remedies may cause an allergic reaction on their own.

LAW. Liquid antacid and water (LAW) is a mixture of 50% liquid antacid and 50% water. In some countries, LAW is simply referred to as Maalox.[iv] LAW is an extremely popular treatment, in part because of its simplicity and the minor cooling sensation patients report when LAW is applied to the skin. Liquid antacid does not belong in the eyes, and although rare, ingredients in antacids may cause an allergic reaction. Research on pain relief provided by topical application of antacid is mixed.[91] One study showed no significant decrease in pain for patients exposed to OC spray after applying liquid antacid.[92] Another showed statistically significant decrease in pain up to the 60 minute mark, but concluded “the difference in [pain levels] may have questionable clinical significance.”[93] Anecdotal evidence supports the idea that LAW decreases pain for OC spray on the skin, but it is not recommended even if it is marginally more effective.[v]

Baby shampoo. Baby shampoo has not been shown to be effective when used in the eyes or on the skin for treating either pepper spray or tear gas.[92,94,95]

FAST. Fixative antacid surfactant treatment (FAST) is a pepper spray remedy originally published on It’s Going Down.[96] FAST was designed to be a more effective alternative to LAW that combined the active ingredients of antacid, sunflower lecithin, and baby shampoo. While there was some experimentation done by the creators to determine whether this treatment was effective, it lacked the rigor be make conclusions. More generally, research on the individual active ingredients suggests that they do not provide a statistically significant decrease in pain.

Cow’s milk. Plain cow’s milk is another common treatment for pepper spray and tear gas. Pouring milk into the eyes has risk of infection, and this is especially true on hot days where the milk will not remain refrigerated before use. The stickiness and stench of milk is another downside of using milk as a decontaminant. Most importantly, cow’s milk used as a treatment for pepper spray has not been show to have a significant effect on pain levels.[92]

Oils. Mineral oil followed immediately by alcohol (MOFIBA) is an outdated treatment for pepper spray contamination that is no longer used by most medics. The treatment worked by covering small patches of skin with mineral oil to attract pepper spray, then removing it with rubbing alcohol. This was retired from use because if done incorrectly can cause additional pain over pepper spray alone. Similarly, people have used vegetable oil to wash the affected area, wiping the residue off after, and this should not be done either. Both of these methods are harmful because oil will trap the RCA against the skin.

Onion. Onions have been inaccurately reported as effective against tear gas. This belief seems to be most prevalent in the Middle East and North Africa. The reported procedure is to breath over whole or cut onions, and in particular to use onions themselves as part of improvised

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[iv] Maalox is the name of a popular brand of liquid antacid.

[v] Some medics swear by this treatment and are going to use it regardless of what this book says. The following two tips will make its use safer. The antacid should be free of flavor and color additives. The only ingredients should be magnesium hydroxide, aluminum hydroxide, and magnesium-aluminum hydroxide.

gas masks to mitigate the effects of inhaling tear gas. RCAs, and in particular tear gas, are lachrymators. Chopped onion releases a chemical which is also a lachrymator. Onions do not mitigate or prevent the effects of tear gas.

Vinegar. Vinegar is another commonly suggested ineffective remedy and preventative measure for tear gas inhalation. Activists suggest using it as a decontaminant on affected skin. It has been suggested to soak a bandana in vinegar then breath through it to prevent inhalation of tear gas. Like tear gas, vinegar is a lachrymator. Vinegar vapor irritates the eyes, and prolonged inhalation will irritate the lungs.

Citrus. Lemon and lime have been suggested to be used like vinegar, both as a decontaminant wash for the skin and with a bandana as a filter for tear gas. There is no evidence either of these have any effect on reducing the irritation associated with tear gas or preventing inhalation.

Hydrogen peroxide. Hydrogen peroxide is another remedy used by activists and medics to treat tear gas and pepper spray. There is no evidence that this has any effect on either, and further, it will cause additional burning sensations if it gets into the eyes or other mucous membranes. Given that pepper spray is mainly aimed at the face and tear gas affects the eyes, nose, and mouth, there is high risk of causing additional harm to the patient even if it was an effective treatment.

Lidocaine. Lidocaine in particular when used as a treatment for pepper spray has not been shown to have a significant effect on pain levels.[92]

Miscellaneous. Some activists have suggested a variety of treatments such as using baking soda paste, topical analgesics, or toothpaste to treat affected areas. These are not recommend as they trap RCAs against the skin and may worsen its effects.

Summary

Riot control agents are lachrymators that are sprayed on to protesters or deployed as an aerosol. Symptoms are a burning sensation where exposed, especially the eyes, nose, mouth, and lungs. More serious symptoms like vomiting, syncope, anaphylaxis, and respiratory distress may be present as well as secondary traumatic injuries from fired cannisters. Because these are area of effect weapons, you will often end up needing to triage and treat many patients at once. Many common remedies for tear gas and pepper spray have limited clinical effectiveness, and so decontamination should only be done with water or saline. Flush the patient's eyes and body with water or saline, and afterwards consider wrapping them in an emergency blanket if there is a risk of hypothermia.

14 : Shock

> But a more careful examination soon serves to show that deep mischief is lurking in the system; that the machinery of life has been rudely unhinged, and the whole system is shocked. . .
>
> Samuel D. Gross, MD[97]

Shock is a reduction in the ability to delivery oxygenated blood to the tissues of the body. It is a secondary, and often lethal, component of many injuries including fractures, severe burns, and blood loss. The onset of shock may be sudden or delayed and, and it may seem to be disproportionate in severity compared to the original injury. Shock can lead to cascading metabolic and organ failure eventually sending the patient into an irreversible death spiral. Proper and prompt management of shock can break this spiral, so it is critical that medics are able to identify patients both at risk for and in shock and begin interventions.

Overview

Shock is a state of insufficient perfusion where the delivery of oxygenated blood is below tissues' demand leading to organ dysfunction. Causes of shock can be simplified and grouped into the three main causes: decreased blood volume, decreased cardiac output, and decreased vascular tone.

Decreased blood volume. Blood volume most obviously decreases when blood is hemorrhaged either into the environment or into body cavities. Any fluid loss can lead to decreased blood volume such as dehydration, diarrhea, or severe burns. Loss of 500 mL of blood is enough to affect blood pressure, and loss of 1500 mL of blood can cause moderate shock.[98]

Decreased cardiac output. Cardiac output is the number liters of blood pumped by the heart per minute. A heart attack may damage heart tissue leading to reduced ability to pump. Cardiac tamponade (fluid buildup in the sac around the heart) can compress the heart leading to decreased cardiac output.

Decreased vascular tone. Vascular tone is the degree of constriction of blood vessels. Decreased vascular tone (corresponding to increased dilation) increases the space that must be occupied by a fixed amount of blood. Global vasodilation can occur due to release of histamine in an allergic reaction. A damaged or severed spinal cord may disrupt the autonomic pathways that control vascular tone leading to global vasodilation. Widespread infection can lead to global inflammation.

Decreased perfusion leads to insufficiency of oxygen and nutrients as well as a buildup of waste products. Without sufficient oxygen, cells begin anaerobic respiration producing lactic acid leading to lactic acidosis. The body is often able to compensate for these conditions, but the compensatory measures may fail leading to tissue and organ damage. In order to protect the heart and brain from this damage, blood is directed from the rest of the body to these organs.

The classic presentation of shock is pale, cool, clammy skin and an increased heart rate. These symptoms are the body's reaction to acute stress and are part of the "fight or flight" response.[98] In a healthy person, these symptoms will subside, and their vitals will return to normal values.

While it may not seem so, shock can be deadly. Shock can also be cryptic in that symptoms do not present early as a warning sign. Shock is most easily treated in its early stages, so it is recommended that medics treat patient who could potentially have shock as if they do have shock until there evidence to the contrary.

Categories of Shock

Shock is commonly divided into four major categories depending on the underlying causes: hypovolemic, cardiogenic, obstructive, and distributive shock.[80] These categories manifest with similar symptoms, and in the context of riot medicine, treatment for all four is the same. The different categories are included here to illustrate what other medical conditions may lead to shock to help you understand when to look out it.

Hypovolemic Shock

Hypovolemic shock is caused by decreased blood volume or decreased body fluids (hypovolemia). Hypovolemia may itself be caused by a number of conditions such as blood loss from hemorrhage (both external and internal); loss of plasma from burns, oozing wounds, or lesions; or loss of sodium and water due to vomiting or diarrhea.

Within riot medicine, hypovolemic shock will generally correspond to traumatic injuries with hemorrhaging or to broken bones accompanied by internal bleeding. Estimating blood loss and assessing the criticality of blood loss are discussed in Chapter 12 ("Wound Management"). Estimating loss of circulating blood due to bone fractures is discussed in Chapter 17 ("Fractures and Dislocations").

Cardiogenic and Obstructive Shock

Cardiogenic and obstructive shock are caused by decreased cardiac output. These two categories of shock present in much the same way and are often grouped together.

Cardiogenic shock is caused by the heart's inability to effectively pump. The underlying cause may be a heart attack (myocardial infarction), blunt vascular injury, or a variety of heart diseases. Obstructive shock is is caused by obstruction of blood flow into the heart via the major veins and arteries. There are many causes, but medics will likely only be able to identify obstructive shock that arises from a tension pneumothorax or pulmonary embolism.

Distributive Shock

Distributive shock is caused by blood vessel dilation or other dysfunction to the blood vessels. This leads to a drop in blood pressure (hypotension) because the fixed volume of blood in the system must fill the increased volume of blood vessels. Distributive shock may be subdivided into anaphylactic, neurogenic, and septic shock.

Anaphylactic shock is caused by anaphylaxis (severe allergic reaction) leading to systemic vasodilation as a result of the body's release of histamine. Neurogenic shock is caused by damage to the central nervous systems by either damage to the spinal cord or traumatic head injury. This damage leads to decreased heart rate and systemic vasodilation. Septic shock is caused by systemic vasodilation an subsequent hypotension arising from infection. It should be noted that medics likely will never encounter septic shock.

Signs and Symptoms

Shock can be difficult to identify because all signs and symptoms may not always be present in each patient, and there are different categories of shock with different manifestations of the symptoms. The following signs and symptoms are generally present.

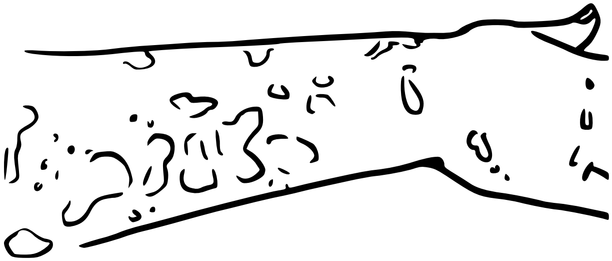
Cardiological observations. The patient has a weak pulse. Their systolic blood pressure may be under 90mmHg, however they may have normal systolic blood pressure and still be in shock.[80] They have an increased heart rate (over 100 BPM) that may be irregular.

General feeling of unwellness. The patient may be sweating and feel nauseous or be fatigued. They may be anxious or restless or even irritable or aggressive. The patient may have increased thirst.

Increased respiratory rate. The patient may have an increased respiratory rate or be taking quick shallow breaths. The patient may hyperventilate with quick, deep breaths.

Abnormal skin signs. As blood is redirected from the skin, the skin may appear pale, cool, and clammy. The skin may be mottled (livedo reticularis). Mottled skin has red, blotchy, lace-like patterns (Figure 14.1).

Figure 14.1: Mottled Skin[71]



Signs of hypovolemia. Patient in hypovolemic shock may have low jugular venous distension, muscle cramps, and dry mucous membranes. They may have decreased skin turgor where their skin does return to its original shape when pinched.

Poor thermoregulation. The patient may not be able to regulate their body temperature. They may be uncharacteristically warm or cool.

Late signs of shock. As shock progresses, the patient's heart rate will increase, and their blood pressure will decrease. As the brain becomes hypoxic, the patient's pupils may dilate or become slow to react to change in light. This will additionally lead to changes in level of consciousness or alertness as well as confusion. Late stage hypovolemic shock may also include decreased urine output, but the time scale for this symptom to become apparent is longer than most actions.

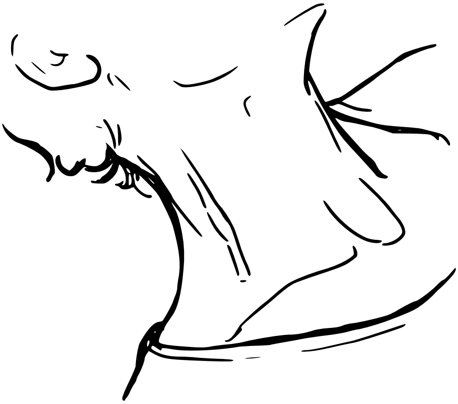
Symptom Variations

Different categories of shock have the following signs and symptoms. These variations may be in addition to or they may contrast with the shared symptoms.

Neurogenic shock. Due to nerve damage, the patient may be in respiratory arrest, and they may have massive and instantaneous systemic vasodilation leading to warm and flushed skin. This vasodilation may lead to priapism (an erect penis in the absence of stimulation). Patients in neurogenic shock may have a decreased heart rate.

Cardiogenic shock. The patient may have distended jugular veins (Figure 14.2).

Figure 14.2: Distended Jugular Veins[71]



Septic shock. The patient may have a fever instead of being cool.

Treatment

The release of stress hormones from physical exertion, fear, or the stresses of physical engagement with the State will produce symptoms that are similar to those of shock, though these symptoms will quickly subside in healthy adults. Conversely, patients with minor injuries (or even no injury at all) may still develop shock. Shock is more likely in patients with multiple or severe injuries. However, you should consider treating all patients with the anything beyond minor injuries for shock, or at the very least request that they sit with you for monitoring for at least 10 minutes.

Due to the potentially life-threatening nature of shock, the ideal treatment is by advanced medical care. If this is not possible, field treatment may be possible. Treatment for shock is a slow process, and the patient will need both time and calmness to recover. For these reasons, shock cannot be treated in a conflict zone, and it is generally inadvisable to treat a patient for shock in the middle of a crowd. If possible, you should quickly transport the patient to a safe place before beginning treatment.

Call EMS. If emergency medical services are available in your region, call EMS using the steps covered in Chapter 6 ("Patient Assessment").

Treat critical injuries. As with all patients, the first priority is to maintain the ABCs. Before moving on to treating shock itself, the patient's primary injuries need to be treated or at least stabilized. This includes controlling hemorrhage or treating contamination of their face by riot control agents.

Position patient for recovery. If the patient is alert, position the patient in the supine position. If they are unconscious or disoriented and nauseated, position the patient in the recovery position.

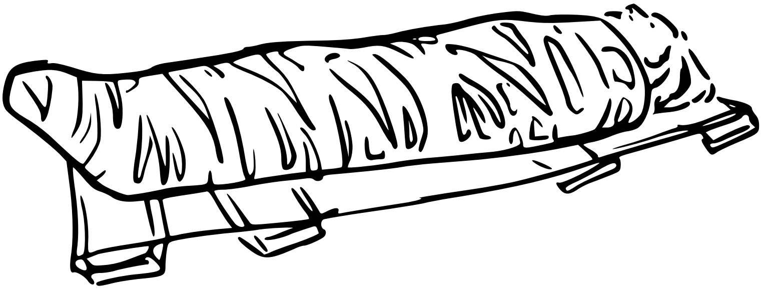
Help maintain normothermia. The patient may not be able to adequately regulate their body temperature, and depending on the weather, you may need to help warm or cool the patient. An unclothed, normothermic patient will neither gain nor lose heat at 28 °C,[25] so most likely treatment will be to help the patient stay warm.

In cool weather, place a mat, tarp, jackets, or (as a last resort) an emergency blanket under to patient to insulate them from the cool ground. Wrap the patient in an emergency blanket or jackets to help keep them warm (Figure 14.3). Additional information on treating and preventing hypothermia can be found in Chapter 21 ("Cold Injuries").

On warm days, move the patient into the shade and consider removing extra clothing. Use a tarp or emergency blanket held a distance greater than 1 m from the patient to provide shade. Consider using cool water on bandanas or and fanning to help cool the patient. Additional information on treating hyperthermia can be found in Chapter 22 ("Heat Illness").

Consider administering fluids. Patients who may imminently require surgery or intensive care should not be given fluids. In urban environments where the patient can be rapidly evacuated to a hospital, fluids should not be administered. In wilderness environments where evacuation may be delayed by hours, patients who are alert and can tolerate drinking may be encouraged to drink a small amount of cool to lukewarm water. This should be limited to 1 or 2 mouthfuls at a time, separated by 10 to 15 minutes reduce the risk of aspiration should the patient vomit. Water may be mixed with a small amount of salt, bullion, or flavoring, though the salt content should not exceed that of saline (0.90% w/v) which corresponds to approximately one small spoonful of

Figure 14.3: Treatment for Shock[71]



salt per 1 liter of water. Drinks should not be excessively sweet or salty and should not contain strong flavors.

Monitor ABCs. The patient's vitals should be continuously monitored until they can be evacuated to advanced medical care.

Urban Legends

To treat shock, some first aid courses teach that the patient should be laid back in an inverse recline position (Trendelenburg position) or flat with their their legs elevated (passive leg raise / modified Trendelenburg position) in order to help move blood from the legs to the torso and head. This does not appear to produce clinically significant physiological changes, may actually be harmful to patients, and may cause discomfort in patients when left in this position for extended periods.[80,99–101] Complications include increased intracranial pressure, difficulty breathing due to gravity pressing organs against the diaphragm, and aspiration of vomit or other fluids. For these reasons, the patient should simply be laid back on a flat surface in the supine position.[i]

Summary

Shock is a complex and life-threatening medical condition consisting of inadequate perfusion of the body's tissues that often presents alongside other injuries, though it may appear in patients with no injuries at all. Symptoms of shock are often pale, cool, clammy skin; sweating;

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[i] This recommendation is not a hard rule, and in some patients the use of the Trendelenburg position may improve cardiac output.[80] However, medics have no way of measuring this, and there are enough cases where the Trendelenburg position can cause harm. For these reason, the simplified rule is to always use the supine position.

irritability, nervousness, or aggression; elevated heart rate; and decreased blood pressure. Minor shock may self-correct, but if left untreated, shock may progress to irreversible tissue damage followed by death. Shock is treated by monitoring the patient's ABCs and maintaining their body temperature. When in doubt, treat patients for shock and evacuate them to advanced medical care.

15 : Brain and Spinal Cord Injuries

> Thus the nation-state is not with the common people – it is an enemy of the peoples.
>
> Abdullah Öcalan, *Democratic Confederalism*[102]

Injuries to the brain and spinal cord can easily happen during riots or other physical engagements with the State and fascists. Cops will punch and swing batons at protesters, and they will "illegally" shoot tear gas cannisters and flashbang grenades at head level. Many street fights end with a knockout or someone getting kicked in the head while on the ground. Aside from confrontations, these types of injuries may be caused by the environment such as falling while occupying a tree or even tripping while running in a crowd.

It is important to remember that for many brain and spinal injuries, patients may still be able approach you without assistance.[i] For this reason, it is important to consider more serious injuries in ambulatory patients and do a more thorough exam.

Physiology

The brain and spinal cord make up the central nervous system (CNS). The CNS is responsible for sending signals to the rest of the body, receiving input from sensory organs, processing information, and making decisions.

The major structures of the brain of the cerebrum, cerebellum, and brainstem. The cerebrum is the largest part of the brain and sits atop the other structures. It the center for language, learning, memory, and sensory processing. Voluntary movements are initiated in the cerebrum and are fine-tuned into smooth, coordinated movements in the cerebellum. The cerebellum is located below the hind part of cerebrum. In addition to coordinating movements and motor learning, there is evidence the cerebellum plays a role in other non-motor functions. The brainstem is located in the lower part of the brain and continues on to become the spinal cord. Two major functions of the brainstem are helping to regulate heart rate and respiratory rate. Thus, damage to the brainstem is immediately life-threatening.

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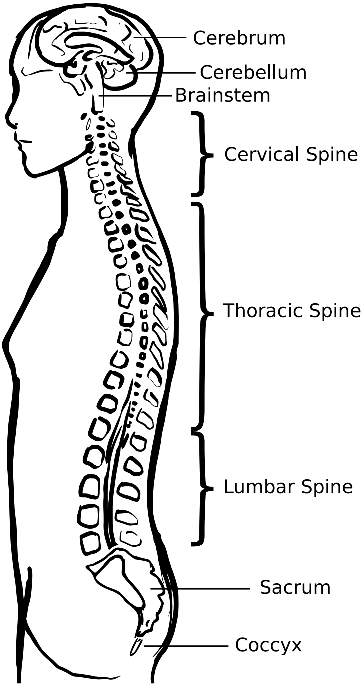
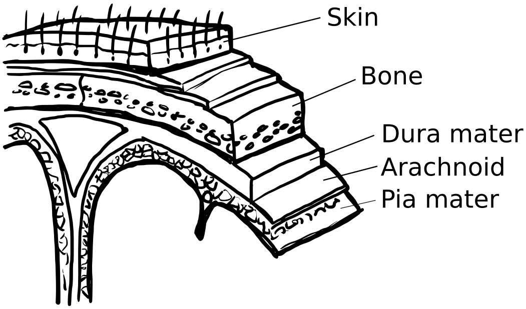
[i] For example, in 2018, during the Men's Snowboard Cross quarterfinals at the PyeongChang Olympics, Markus Schairer crashed breaking a vertebra in his neck (C5).[103] Schairer was able to complete the event, but was taken away by medical personnel. He required surgery, but recovered.

Figure 15.1: Central Nervous System[71]



The meninges are protective membranes that surround the brain (Figure 15.2). From outermost to innermost they are the dura mater, arachnoid, and pia mater. Cerebrospinal fluid (CSF) fills the space between the arachnoid and the pia mater (subarachnoid space). The brain is approximately neutrally buoyant in CSF which protects the brain from compression under its own weight. CSF also nourishes the brain and removes waste.

Figure 15.2: The Meninges[71]



The human skull is made up of 22 bones: 14 in the facial skeleton and 8 in the neurocranium (also known as the braincase). The bones of the neurocranium protect the brain from damage with the bones on the top and sides being the strongest. The cerebrum and cerebellum are completely encased by the neurocranium. The brainstem exits the neurocranium and continues into the vertebral column.

The vertebral column, also known as the spine, is a column of 33 vertebra running from the base of the skull through the pelvis. The vertebrae give support to the body and protect the spinal cord. The spinal cord is a structure made of nervous tissue that extends from the brain stem and runs through the spinal canal in the vertebral column. The spinal canal is filled with CSF that serves the same functions as it does in the skull. As it descends away from the brain, the spinal cord branches into the various nerves of the peripheral nervous system.

The spinal cord facilitates communication with the peripheral nervous systems (PNS). The PNS extends from the spinal cord into the rest of the body and receives information from the world and sends it to the brain as well as receives information from the brain and delivers it to the body. The PNS is made up of both the somatic nervous system (voluntary) and autonomic nervous system (involuntary).

The tissues of the CNS do not extensively regenerate and are very sensitive to oxygen deficiency. Injuries and even short periods without oxygen can lead to permanent disability. Trauma to the CNS can cause temporary or permanent impairment of motor functions, sensation, and cognition.

Head Injuries

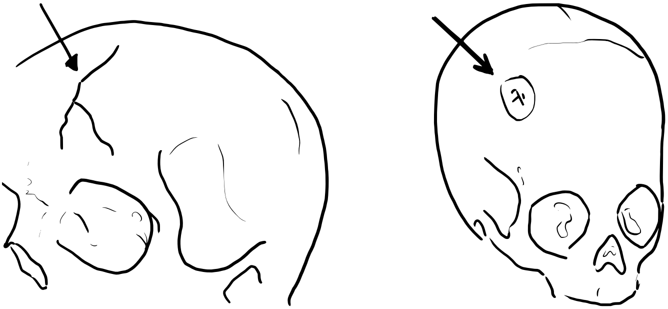
During actions, brain and spinal cord injuries are often caused by trauma to the head and neck. Injuries to the face, scalp, and skull may indicate CNS injury, but this is not always the case. Conversely, CNS injuries may be present in the absence of head trauma. When treating patients with head injuries, they should be monitored for additional brain injury.

Skull Fractures

Skull fractures are not necessarily life-threatening, though some may be potentially lethal even if they do not visually appear to be severe. Fractures are classified as either open or closed. In open fractures, the fractured bone is exposed to the environment either by tearing through the skin or if there is laceration directly over the fracture. Other fractures are closed fractures.

Aside from being open or closed, skull fractures can be further divided depending on the location and nature of the fracture. A linear fracture (Figure 15.3a) is a fracture that runs in a fairly straight line without bone displacement. A depressed fracture (Figure 15.3b) is a fracture that displaces bones inward in a crater-like fashion.

Figure 15.3: Skull Fractures[71]

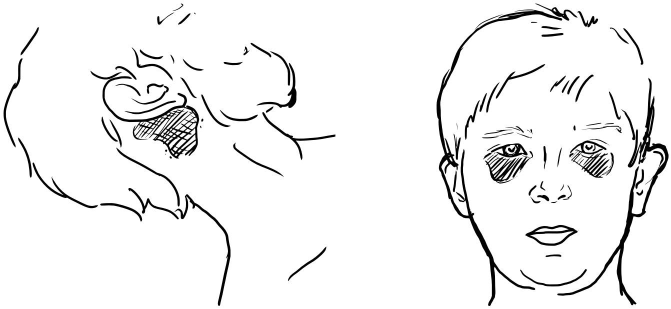


(a) Linear Fracture

(b) Depressed Fracture

A basilar fracture is a fracture in the base of the neurocranium (also known as the cranial floor). A basilar fracture may lead to a CSF leak and may be accompanied by Battle's sign or raccoon eyes. Battle's sign is bruising or blood accumulation behind the ears (Figure 15.4a). Raccoon eyes, also known as panda eyes, is the bruising of the soft tissue around the eyes (Figure 15.4b). Raccoon eyes may be either unilateral or bilateral. Both Battle's sign and raccoon eyes may take several hours to present after the initial injury.

Figure 15.4: Signs of Basilar Skull Fracture[71]



(a) Battle's Sign (b) Raccoon Eyes

A complication of a fracture is that bone may tear the meninges and cause bleeding or fragments may dislodge and damage brain tissue. With an open fracture, the meninges and possibly the brain are exposed to the environment. This carries risk of lethal infection.

Treatment for Skull Fractures

Treatment is to determine if a fracture is likely present and to evacuate the patient to advanced medical care.

Inspect their skull. If the patient is not bleeding, check their skull for depressed fractures. If the patient is bleeding, first stop bleeding as discussed in the section on scalp wounds. Visually inspecting their head for depressions, irregular shape, and compound fractures followed by gently palpating the patient's head. If there is pain, tenderness, or swelling, there may be a fracture.

Consider irrigation. If you do not suspect that the patient has an open fracture, you may clean wounds as usual. Otherwise, do not clean or irrigate wounds as this may introduce bacteria into the meninges or brain. This can increase the chances of fatal complications. Stop the bleeding and evacuate the patient to advanced medical care.

Dress open fractures. Dress open fractures like a scalp wound. Instructions can be found in the section on scalp wounds.

Check for signs of cranial trauma. Check for Battle's sign or raccoon eyes to determine if the patient has a basilar fracture. If a patient has a tear in their dura mater, CSF may begin to leak. A CSF leak has symptoms similar to other brain injuries and may additionally be indicated by clear drainage from the nose of ears. Patients may report a sweet and salty taste in their mouth. CSF leaks often co-present with basilar fractures. Check for bleeding from the ears. This may be a sign of cranial trauma. Patients with a CSF leak or bleeding of the ears need immediate evacuation to advanced medical care.

Allow drainage. If the patient is bleeding from their nose or ears, or if CSF is leaking from the nose or ears, do not attempt to control this bleeding or drainage. This may cause an increase in intracranial pressure (ICP) which may cause additional brain damage. Additionally, patients should avoid coughing, sneezing, or engaging in other activity that can increase pressure in their head.

Keep patient upright. Keep the patient sitting in an upright position. Laying down may increase ICP which can complicate injuries.

Consider evacuation strategy. All patients with a suspected skull fracture should be treated by advanced medical care. The decision is whether they require rapid evacuation, such as by ambulance, or if they can take conventional means to reach a hospital. Patients with open fractures, a CSF leak, or an altered level of consciousness need immediate evacuation.

Monitor vital signs. While you are waiting for evacuation or during evacuation, monitor the patient's level of consciousness and ABCs.

Warn of delayed signs of skull fracture. Patients may not consent to evacuation, and they may not appear to have a skull fracture. When you discharge your patient, inform them of the warning signs of a skull fracture so that they will know if the need to seek advanced medical care in the following hours. If they have a comrade present, recruit them to help monitor the patient for bruising that can indicate a skull fracture or CSF leak as the patient may not have access to a mirror during an action. Use of masks and other facial coverings may prevent patients or their comrades from being able to detect these symptoms, so they should be suggested to make hourly checks if it is safe to do so. This comrade should likewise monitor them for signs of TBI.

Scalp Injuries

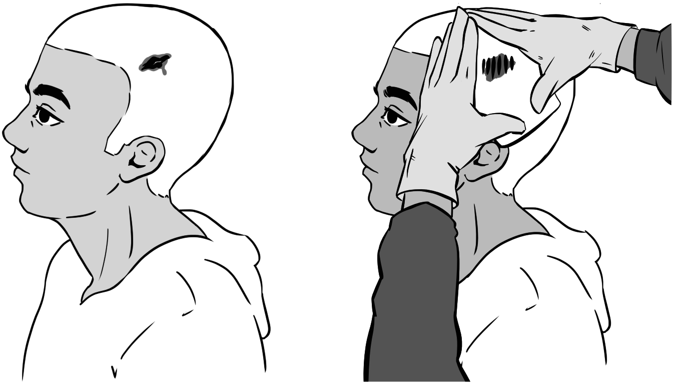
The scalp has a large number of arteries and veins running through it, and because of the structure of tissues, damaged blood vessels do not retract. As a result, cuts to the scalp may bleed profusely or bruise severely. Due to the possibility of significant blood loss, patients are at risk for shock.

Treatment for Scalp Injuries

Treatment for scalp injuries is similar to treatment for open wounds on other parts of the body, however the medic should extra cautious of underlying fractures. Medics should also consider traumatic brain injury for all scalp injuries. See Chapter 12 ("Wound Management") for more information.

Stop bleeding. If you suspect the patient has a depressed skull fracture, do not apply direct pressure to the wound. Instead cover the wound with gauze and apply gentle pressure around the wound (Figure 15.5). Otherwise, apply direct pressure.

Figure 15.5: Applying Scalp Pressure[104]



Consider irrigation. As mentioned in the treatment of skull fractures, open fractures should not be cleaned or irrigated. If you suspect there is a fracture beneath the wound, avoid irrigation.

Dress the wound. Gauze should be placed over the wound, and firm pressure should be applied until bleeding stops. Use a gauze roll or elastic net dressing to secure the gauze in place.

Consider shock. Due to blood loss, the patient may go into shock. Monitor the patient for shock.

Consider traumatic brain injuries. Scalp injuries may be accompanied by traumatic brain injuries (TBI). Consider investigating a TBI and evacuating if indicated.

Consider evacuation. Patients with scalp bleeding in the absence of a fracture do not necessarily require advanced medical care. However, depending on the severity of the laceration, you may want to direct them to advanced medical care for sutures both for cosmetic reasons and to aid in in healing.

Brain Injuries

Brain injuries can be categorized in several ways. First, they can be divided into congenital (existing at or before birth) or acquired. Congenital brain injuries are outside of the scope of this book. Acquired brain injuries can be further divided into traumatic (injuries caused by external mechanical force) and non-traumatic (such as by infection, stroke, or other tissue death).

Traumatic Brain Injuries

Traumatic brain injuries may be caused by a direct hit to the head or by other rapid acceleration of the head such as the head snapping forward or backwards following large forces acting on the torso as in the case of whiplash. The injuries done to the brain and it's protective tissues can include contusions (bruising) of brain tissue, hemorrhage or hematomas (bleeding in the brain or skull), or the stretching or tearing of brain tissue.

Because the brain is encased in a closed, rigid space, swelling and bleeding can cause an increase in intracranial pressure (ICP). This pressure can cause a decrease in perfusion of the brain tissues and herniation of the brain out of the neurocranium. Lack of nutrients and oxygen can cause tissue death and permanent brain damage. In the short term, insufficient perfusion or brain herniation can disrupt normal brain functions ranging from speech and general cognition. It may also lead to impairment to the autonomous nervous system that regulates breathing, heart rate, and blood pressure.

In the field, you will not be able to make a diagnosis as to the exact type of traumatic brain injury a person has, due to a lack of expertise and diagnostic equipment. The question you will need to answer is whether the patient can return to the action, whether they should go home and rest, or whether they need evacuation to advanced medical care. You may not be able to make this decision immediately after you initial and secondary assessments as some symptoms do not immediately present. Patients with a potential brain injury will need extended monitoring to see if symptoms develop or worsen compared to other types of trauma which are more immediately noticeable.

Mild Traumatic Brain Injury

Symptoms of a mild brain traumatic injury (MTBI) are any of the following symptoms.

Altered level of consciousness. The patient may have a brief change in level of consciousness (LOC) following a brain injury. Using the AVPU scale, this means anything below A+O×4.

Altered cognition. The patient may have a brief change in mental status including mood changes; confusion; or difficultly with thinking, concentrating, or paying attention. Patients may have brief retrograde amnesia or anterograde amnesia. Retrograde amnesia is a failure to recall memories that occurred before the injury. Anterograde amnesia is a failure to create new memories after the injury. Anterograde amnesia may present as the patient being "caught in a loop" where they ask the same questions repeatedly.

Sensory disturbances. The patient may have temporary vision disturbances such as "seeing stars," blurred vision, or double vision. They may have tinnitus (ringing of the ears) or a bad taste in their mouth.

Nausea and vomiting. The patient may have nausea with or without isolated vomiting. Vomiting without nausea may indicate increased ICP which is a medical emergency.

General unwellness. The patient may have a mild to moderate headache, dizziness, difficulty balancing, or lightheadedness. The patient may feel lethargic or fatigued.

Severe Traumatic Brain Injury

Symptoms of a severe brain injury include any of the symptoms of a mild brain injury as well as any of the following symptoms.

Worsening symptoms. The patient may have a persistent or worsening headache. They may have persistent or worsening vision disturbances. They may have protracted vomiting and nausea.

Pupil changes. One or both pupils may become dilated or fail to respond to bright light, though this is a later developing sign.

Severely altered cognition. The patient may have worsening cognitive functions. Speech may be impacted such as aphasia (difficulty finding and understanding words), slurred speech, or dysarthria (disordered speech caused by muscle weakness). They may have severe or worsening ability to pay attention, processing speed, or executive functioning. The patient may have a loss of coordination, paresis (weakening of one or more limbs), or full paralysis.

The patient may have changes in mood such as confusion, restlessness, agitation, or combativeness. They may have changes in social behavior or may display unusually poor social judgement.

Severely altered LOC. The patient may have alternating periods or responsiveness and unresponsiveness, or their LOC may steadily decrease.

Often, they will progress down the scale from disoriented, to irritated, to combative, to unresponsive. They may have convulsions or seizures. The patient may position their body in abnormal ways, especially in response to the application of a painful stimulus.

Altered vital signs. They may display Cushing's Triad which is a sign of increasing ICP: decreased heart rate, increased blood pressure, and hypoventilation. The patient may have warm and flushed skin.

Bleeding from the ears. Bleeding from the ears may be a sign of open cranial trauma. This diagnosis can only be differentiated by a doctor who can perform a CT or MRI scan. You need to assume bleeding from the ears is due to severe traumatic brain injury.

Treatment for Traumatic Brain Injury

Treatment for a traumatic brain injury includes considering complications and considering whether the patient needs evacuation.

Consider personal and patient safety. If your patient is combative, you may need to give them space and encourage others to stay back. Your patient may be a threat to your and other's safety. Be prepared to deescalate police if they arrive as your patient may not be able to follow verbal commands.

Monitor the patient. Patients who display signs of a TBI should be encouraged to sit or relax while they are monitored for worsening symptoms. Evaluation of mental status can be done through casual conversation. A common diagnostic technique to help detect difficulty with concentration is to ask the patient to remember a specific word you provide (e.g. "avocado") and ask them to recall the word a few minutes later. When evaluating their LOC, you will ask them basic questions about the location and date to establish orientation. By the end of this, you will have a good idea of their mental status. Measure their heart rate, respiration rate, and blood pressure to have a baseline for future comparison. Check their pupils.

Consider immobilization. Traumatic brain injuries may have associated spinal injuries. Consider whether the patient needs to have their cervical spine stabilized and take appropriate measures.

Rescue position and monitoring. Patients with degraded levels of consciousness should be placed in the rescue position in the event that they vomit. Continuously monitor their vital signs.

Consider evacuation. A patient who has lost consciousness or is presenting any of the signs of a severe TBI requires immediate evacuation to advance medical care. A patient who at any point fell below A+O×4, had confusion, or had other degraded cognitive ability should be sent home. Patients who are sent home should have a comrade stay with them for 24 hours to monitor their mental status for signs and symptoms of late-developing brain injury. Any patient who is not sent home should have comrade who can watch them for decreasing LOC or cognitive abilities.

Acquired Brain Injuries

There are many illnesses that may affect the brain, but their diagnosis and treatment are beyond what most medics can reasonably assess or treat, so they are out of scope for this book. Only strokes will be discussed in this section. For drug overdoses, see Chapter 26 ("Drug Overdoses").

A stroke occurs when poor perfusion of the brain causes cell death. Strokes may be caused by a lack of blood flow (ischemic) or bleeding (hemorrhagic). Hemorrhagic strokes may be due to bleeding in the brain tissue, ventricles, or subarachnoid space.

Signs and symptoms of a stroke can be decrease (paresis) or loss (paralysis) in the ability to move, especially limited to one side of the body (hemiparesis). Other signs and symptoms can be problems understanding speech, speaking, loss of vision in one eye, and dizziness. Patients with hemorrhagic stroke may additionally have a severe headache.

If you suspect a patient may have a stroke, you can rapidly diagnose them with the FAST technique. FAST stands for: facial droop, arm weakness or drift, speech difficulty, and time to call EMS. If a patient has abnormal findings for any one of these three tests, it is likely they have a stroke and need immediate evacuation to advanced medical care.

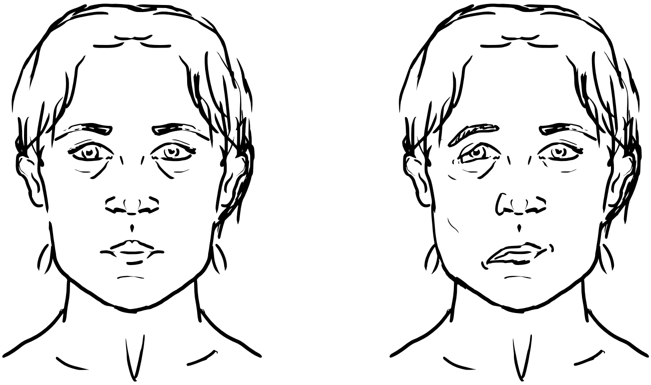
Table 15.1: FAST Stroke Diagnosis

F	Facial droop
A	Arm weakness or drift
S	Speech difficulty
T	Time to call EMS

Facial droop. Ask the patient to smile or show their teeth. A normal finding is that both sides of the face move equally. An abnormal finding is that one side of the face does not move as well as the other or does not move at all. Examples of normal and abnormal findings can be found in Figure 15.6.

Arm weakness or drift. Ask the patient to close their eyes and hold both of their arms out straight at shoulder level with their palms

Figure 15.6: Testing for Facial Droop[71]



(a) Normal (b) Abnormal

facing upwards for 10 seconds. A normal finding is that both arms remain level and the palms do not rotate inwards. It is also normal for patient's hands to rotate slightly inward and more so on their dominant arm or for both arms to lower slightly. It is abnormal for one arm to significantly lower, rise, or rotate inwards.

Speech difficulty. As the patient to repeat a simple or common sentence such as "the chicken crossed the road." A normal finding is that the patient can clearly repeat the sentence back to you. An abnormal finding is if the patient has slurred, missing, or jumbled words.

Time to call EMS. If a patient tests positive for a stroke, they need immediate evacuation to advanced medical care. The faster the evacuation to definitive care, the less the likelihood of permanent damage. This is the only treatment medics can provide.

Spinal Injuries

A spinal cord injury (SCI) is an injury that causes temporary or permanent impairment of the spinal cord's ability to send and receive signals from the peripheral nervous system (PNS). Spinal cord injuries can be both traumatic and nontraumatic in origin. This book only discusses traumatic SCIs as nontraumatic SCIs will generally not present acutely in riot contexts.

Injuries to the spinal cord can be caused by hyperflexion, hyperextension, lateral movement, rotational movement, compression, or distraction (pulling apart of vertebrae). The smaller, more flexible vertebrae of the cervical spine are at greater risk for injury than that larger, more robust thoracic and lumbar vertebrae. This is why medics are advised to consider stabilizing the cervical spine during the primary assessment.

Generally speaking, nerves that exit the spinal cord higher up innervate (supply nerves to) the upper parts of the body, and likewise with the lower. It is approximately correct to say that:

- The nerves that emerge from the cervical spine (neck) innervate the neck, arms, and diaphragm
- The nerves that emerge from the upper thoracic spine (upper back) innervate the torso above the waist
- The nerves that emerge from the lower thoracic spine (mid back) innervate the abdomen
- The nerves that emerge from the lumbar and sacral vertebrae (lower back) innervate the legs

Injuries that happen at a given location on the spine cord will affect all nerves that branch off at a lower location. Injuries to the spine may not damage the spinal cord, but may damage the nerves as they emerge from the vertebra. For example, a patient with dysfunction in one arm but not their legs may have a spinal injury that affects the nerve as it emerges, but not the spinal cord itself. This is noted to help prevent you from failing to diagnose a spinal injury that does not have nerve dysfunction to "everything below some vertebra."

Spinal cord injuries can be divided into complete and incomplete. An injury is complete if all nerve function below injured is lost, otherwise the partial functionality means it is an incomplete injury.

Signs and Symptoms

A patient with a spinal injury may have numbness, tingling, loss of sensation, loss of strength, paralysis, or incontinence. These symptoms checked by testing the patient's CSM (circulation, sensation, motion). The patient may be in respiratory distress or respiratory arrest. As noted in Chapter 14 ("Shock"), the patient may be in neurogenic shock and have warm flush skin due to global blood vessel dilation.

Softness or tenderness on the spine is an indication of spinal injury and may need be treated as such by the attending medic. However, absent other symptoms, the patient may insist that they are ok and refuse care.

Treatment for Spinal Injury

Treating a patient with a potential spinal cord injury is done by checking their ABCs, immobilizing their spine either using your hands or a medical device, and then carefully moving them to a pad or stretcher. As noted previously, the rule of thumb is to treat what kills the patient first. If you are the only medic, do not let c-spine stabilization prevent you from attending to more urgently life-threatening conditions.

Immobilizing the Spine

You will need to immobilize the patient's spine. If your patient is standing or sitting, and they do not have immediately life-threatening injuries, ask the patient to remain still and to not move their neck or back. Skip to the focused spine assessment, which is discussed later in this chapter. There is a good chance that they do not have a spinal injury, and it is best to eliminate this early.

To immobilize the spine, place one hand on either side of the patients head. If they are sitting or standing, stand behind them. If they are on the ground, position yourself above their head. Gently return their head to a neutral position: one that is neither angled up nor down and is looking "forward." While you are moving their head, if you feel any resistance or hear bone rubbing (crepitus), cease moving their head and leave it in its current position.

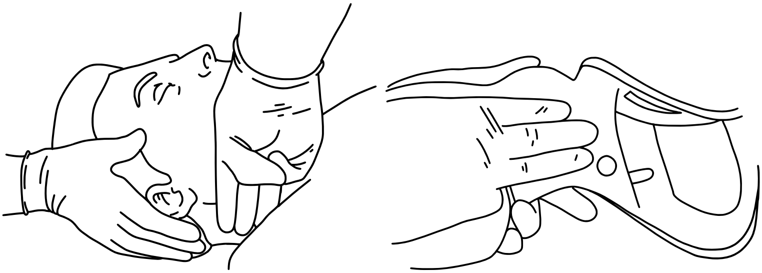
Cervical Collars

Manually immobilizing a patient's c-spine is impractical for long periods of time. You may need free hands to treat other wounds, and the patient may need to be transported. Use of a commercial or improvised cervical collar will help immobilize the patient's c-spine.

Commercial cervical collars. Commercial cervical collars are made of foam and plastic, and they have adjustable sizes (Figure 15.7). To size an adjustable collar, hold your hand against the patient's shoulder with your fingers outstretched as if in a salute. Draw an imaginary line from the patient's chin, and see which finger intersects this line. Hold these fingers against the sizing markers on the collar. Adjust the collar to match, and lock the sizing snaps in place.

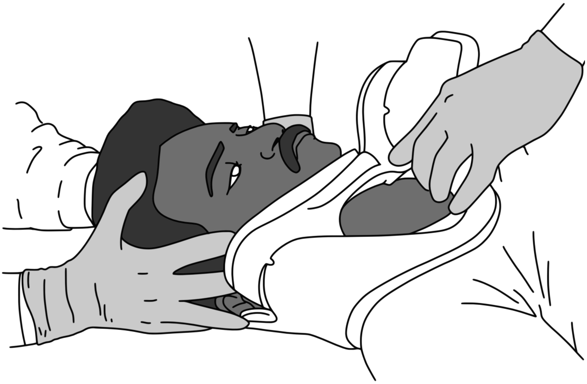
While one medic immobilizes the patient's c-spine, another medic slides the collar under the patient's neck. The medic holding the immobilization must move their hands as the first medic closes the collar, using a scooping motion to catch the patient's chin in the chin support of the cervical collar.. Use the velcro strap to secure the collar in place. You may need to resize the collar so that the collar is not loose and there is

Figure 15.7: Cervical Collar Measurement[12]



(a) Measuring (b) Adjusting

Figure 15.8: Cervical Collar Application[12]



not tension against the patient's neck.

Improvized cervical collars. An improvized cervical cervical can be made made from a hoodie or thick sweater. With the arms outstretched, roll the waist of the sweater toward the collar to form a cylinder shape. While one medic immobilizes the patient's c-spine, another medic slides the garment under the patient's neck, wraps it around their neck, and loosely ties the arms together to the front. Ensure you do not restrict their breathing or circulation.

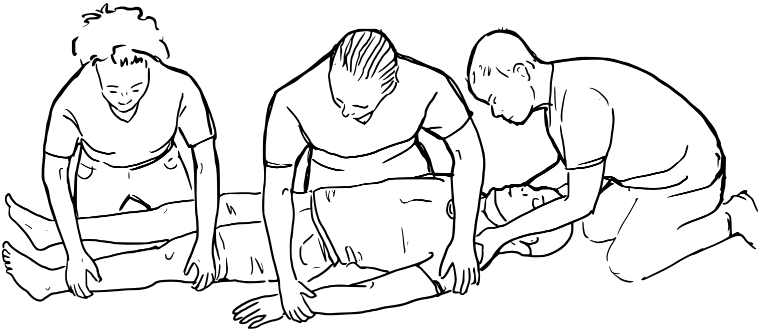
Improvised cervical collars will likely not immobilize a patient's c-spine as well as manual stabilization during transport. If you need to evacuate a patient and use an improvised cervical collar, you should additionally have one medic manually hold the patient's c-spine in alignment during transport.

Rolling a Patient

In order to perform a focused spine assessment, you will need to roll the patient on to their side. You may also need to do this to drain fluid from their mouth or to get them on to a stretcher.

To roll the patient, you ideally need three people, one of which does not need to be medically trained. In the following instructions, these people are Medic 1, Medic 2, and Volunteer 1. Patients can be rolled to either the left or the right, but in this example the patient is being rolled on to their right side. This is illustrated in Figure 15.9.

Figure 15.9: Rolling a Patient with a Spinal Injury[71]



1. The medics and volunteer position themselves around the patient.
    - Medic 1 kneels above the patient's head and stabilizes the c-spine.

   - Medic 2 kneels to the right of the patient at chest level leaving space for the patient to roll towards them. Medic 2 places their hands on the patient's shoulder and upper back directly behind their arm.
   - Volunteer 1 positions themself similarly at the patient's hip level, placing their hands on the patient's side and hip.
2. Medic 2 moves the patient's right arm up along side their head so it can be used as a support for the patient's head when they are on their side.
3. Medic 1 says "We are going to roll the patient to the right on three. Ready? One, two, three."
4. Medic 1 keeps the patient's head in a neutral position while Medic 2 and Volunteer 1 roll the patient on to their side; the weight of the patient's torso should rest on Medic 1's kneeling thighs.
5. Medic 2 ensures that the patient's arm is in placed to support the patient's head.
6. Medic 2 provides additional stabilizing support the patient's head while Medic 1 removes their hand from between the patient's head and the patient's arm.

Similar steps are used in reverse to roll the patient from the rescue position on to their back.

Focused Spine Assessment

Because of the severe and possibly permanent effects of spinal injury, it best to make conservative decisions about immobilizing the patient. When in doubt, immobilize their c-spine. If after the primary and secondary assessment, you have reason to believe that the patient is free from a spinal injury, you can perform a focused spine assessment to determine if the spine needs further immobilization. If a patient fails to meet any one of the criteria, you are unsure of the results, or your instinct tells you otherwise, you should continue to immobilize their spine.

Additionally, if you do not need to move the patient and they are able to wait for EMS to arrive, you may chose to skip this step and let advanced medical personnel examine the patient. If you need to move the patient or they do not want EMS assistance, you should perform the focused spine assessment. All of this is complicated by the patient's desire to not be a burden, to not be at the center of a scene, and their aversion to potential medical bills. As a medic, it is your responsibility to help them make an educated decision about what sort of care they should be willing to accept at a given time.

The criteria for clearing a patient using the focused spine assessment are as follows:

1. The patient is reliable.
    (a) Their LOC is A+O×4.
    (b) They are unintoxicated.
    (c) They are not distracted either by preoccupation, onlookers, or rioting happening around them.
    (d) They are not distracted by another injury such as a broken arm or leg.
2. The patient has normal CSM in all four extremities.
    (a) Their skin is warm and pink, and they have radial/pedal pulses.
    (b) They have normal sensation and no tingling or numbness.
    (c) They can move their hands/feet and have strength unless a lack thereof can be explained by another injury.
3. Their entire spine is free of pain and tenderness when palpated.

You will need two trained medics and a volunteer to help with the focused spinal assessment. One will hold the patient's cervical spine in alignment, and another will palpate the spine.

To palpate the spine, you need to have direct access to the spine from the base of the skull to the bottom of the back. This cannot be performed over bulky clothing. You will use the steps described previously for rolling a patient. One medic stabilizes the c-spine and directs two volunteers to roll the patient on to their side. Another medic palpates the spine starting from the base of the skull and working towards the pelvis. Each vertebra should be individually palpated. If the palpation is painful, the patient may have a broken vertebra. Stop the examination and roll the patient on to their back. Evacuate the patient to advanced medical care.

Summary

Brain and spinal cord injuries can have potentially life altering complications, so if you are unsure about the nature and severity, it is best to evacuate the patient to advanced medical care.

Brain injuries may require additional monitoring to check for change in mental status following the injury. Some symptoms may not quickly present, and patients who are discharged should be discharged with a comrade who can help monitor them over the next several hours should their condition worsen. Patients who are bleeding from their ears; who have Battle's sign, raccoon eyes, or a possible CSF leak need; or who have lost consciousness need to be immediately evacuated to advanced medical care.

Patients with a potential spinal cord injury need advanced medical care unless they can be cleared by a focused spinal assessment.

16 : Chest Injuries

> I think it is healing behavior, to look at something so broken and see the possibility and wholeness in it.
>
> adrienne maree brown, *Emergent Strategy*[105]

Aside from the brain, the most important organs in the human body are located in the chest. Chest injuries can range from something easily managed like a minor rib fracture to more serious injuries that can lead to life-threatening interruptions to the cardiovascular and respiratory systems. Possible causes of chest injuries medics will likely see are: being struck by a blunt object (such as a police baton), getting hit by a vehicle, being stabbed or shot, or falling from a height.

The physiology of the chest covered in Chapter 11 ("Basic Life Support") is recommended reading before starting this chapter.

Physiology

The chest, also known as the thorax, is the part of body between the neck and the diaphragm. The part of the torso below the diaphragm is the abdomen. Structurally, the chest includes both the rib cage and the shoulder girdle. The rib cage is the vertebral column, ribs, and sternum (breastbone). The shoulder girdle is the clavicles (collarbones) and scapulae (shoulder blades). The chest also includes the muscles, skin, and connective tissues surrounding these structures.

There are twelve pairs of ribs numbered according to which thoracic vertebra they attach to. The first seven ribs are called true ribs and are connected to the sternum by cartilage. The next five ribs are called false ribs. The first three false ribs are connected to the sternum by a common cartilaginous connection. The last two false ribs are "floating ribs" that are not connected to the sternum at all.

The interior space of the chest is the interior space of the ribcage above the diaphragm. This is called the thoracic cavity. The thoracic cavity houses the heart, great blood vessels (aorta, vena cava, and their major branches), lungs, bronchi, trachea, and esophagus. The thoracic cavity is protected by the thoracic wall which is made up of the ribs, muscle, and connective tissue. The intercostal muscles are the muscles of the thoracic wall connected to the ribs, both between and along the chest wall.

The pulmonary pleurae, normally referred to simply as pleurae, are the membranes that surround the lungs. The parietal pleura is the outer pleura and is attached to the interior of the thoracic wall and covers the upper surface of the diaphragm. The visceral pleura is the membrane that covers the outside of each lung. Between the two pleurae is the fluid-filled pleural space.

Between the lungs is the mediastinum, the central space of the thoracic cavity and houses the heart, esophagus, and trachea, among other structures.

Rib Fractures

A rib fracture is a fracture to one of the ribs. Rib fractures with a single break with no bone displacement can be called hairline or simple fractures. Fractures are less common in ribs 11 and 12 as they are more flexible and will flex further before breaking. Possible complications of a rib fracture include pneumothorax and hemothorax which are discussed later in this chapter. Patients may also develop pneumonia due to their inability to breath deeply or cough. Pneumonia develops slowly and is not of immediate concern for medics.

Signs and Symptoms

A patient with a fractured rib will have pain at the site of the fracture with tenderness when it is palpated. There may be bruising at the site of the fracture. The patient may have chest pain that is sharp and stabbing when they breath in, cough, or sneeze. They may have a shortness of breath and exhibit rapid, shallow breathing as they alter their breathing to compensate for the pain.

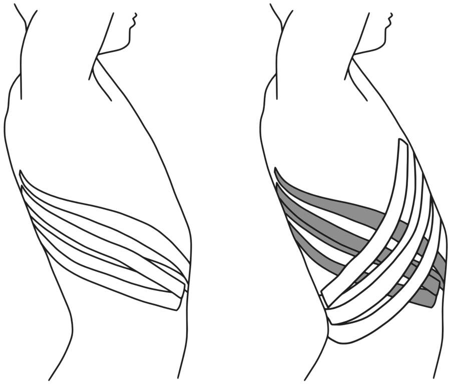
Treatment

Treatment for a fractured rib is to immobilize the rib, manage pain, and consider evacuation to advanced medical care.

Immobilize the rib. Pain can be managed by immobilizing the rib. Taping, slinging, or both together can be used together to immobilize a fractured rib.

Tape the rib. To tape a fracture, use 4 to 6 long strips of 5 cm medical tape to immobilize the rib. The strips should be placed roughly perpendicular to the rib and stretch from the spine to the sternum. (Figure 16.1). Optionally, place a second set of tape perpendicular to the original to make a crosshatch pattern. When taping, do not wrap fully around the chest as this may inhibit respiration.

Figure 16.1: Taping a Fractured Rib[12]



Sling the arm. Stabilization of the fracture can also done by slinging the arm on the same side as the fracture. This will help immobilize the arm and prevent movement of the ribs. See Chapter 17 ("Fractures and Dislocations") for instructions on how to fashion a sling.

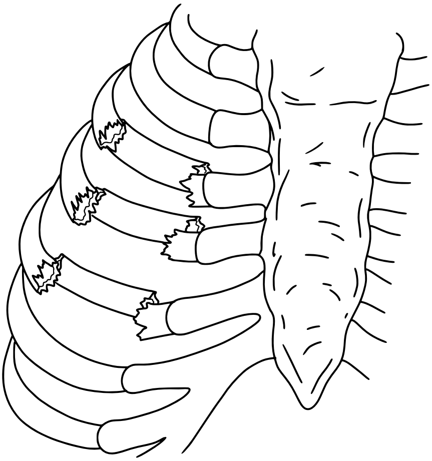
Consider use of NSAIDs. If you carry NSAIDs, consider suggesting the patient self-administer following the guidelines in Chapter 9 ("Medication").

Consider evacuation. Simple rib fractures themselves do not require advanced medical care. However, traumatic rib fractures may have concomitant injury to underlying viscera. Patients who have fractures caused by high-energy impacts, with displacement, or with severe pain should be evacuated to advanced medical care.

Flail Chest

Flail chest, also called an unstable chest wall, is when multiple adjacent ribs have fractures with displacement in multiple places causing a segment of the thoracic wall to move independently of the rest of the chest (Figure 16.2). A large amount of force is necessary to cause a flail chest, so patients likely have other injuries, possibly including pulmonary contusions.

Figure 16.2: Flail Chest[12]



A key feature of flail chest is a phenomenon called paradoxical breathing (Figure 16.3). In a patient with a flail chest, the negative pressure during inspiration will cause the loose segment of the thoracic wall to move inwards while the rest of the chest expands. Conversely, the positive pressure during expiration will cause the loose segment to move outwards while the rest of the chest contracts.

Signs and Symptoms

A patient with flail chest will exhibit all the signs and symptoms of a fractured rib. Additionally, they will have paradoxical breathing. They may be in or develop respiratory distress.

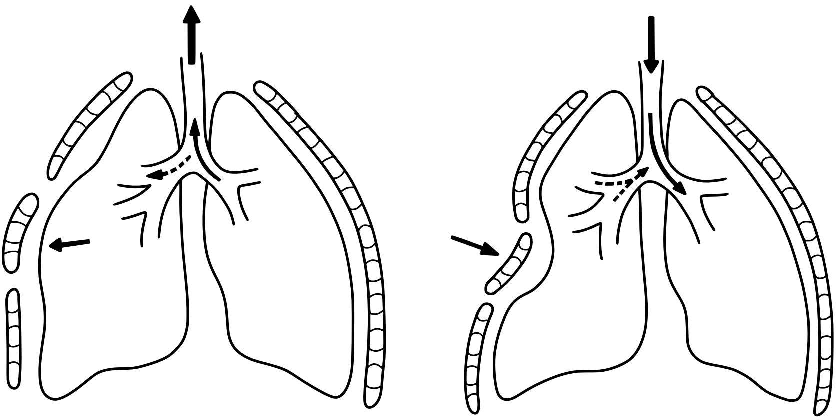
To identify flail chest, place one hand under the patient's clothing over the suspected loose segment of the chest and feel for paradoxical movement while the patient breathes. You may feel or hear crepitus. The paradoxical movement may be noticeable on visual inspection.

Treatment

Treatment is to stabilize the unstable segment of the chest wall, treat for shock, and evacuate the patient.

Stabilize the chest wall. You will need to stabilize the loose segment of chest wall. This can be done by taping a bulky dressing over the loose segment. Do not wrap tape fully around the patient's chest as this can restrict their breathing. The patient can also hold bulky article

Figure 16.3: Paradoxical Breathing[12]



of clothing against the loose segment.

Position the patient comfortably. While you are waiting for evacuation, have the patient find a comfortable position that minimizes pain at the fracture site. This may be on their back or sitting up in a reclined position. They may find it most comfortable to lay on their side with the fracture with a bulky piece of clothing held against the injury.

Treat for for shock. The patient is at risk of shock due to pain and poor quality respirations. Treat the patient for shock.

Consider administration of analgesics. If evacuation will be prolonged or delayed, consider administering analgesics to reduce pain and make breathing more comfortable using the guidelines in Chapter 9 ("Medication").

Evacuate. Flail chest is a medical emergency. Immediately evacuate the patient to advanced medical care.

Lung Injuries

Chest trauma may cause injury to the lungs or pleurae. This may be caused by, among other things, fractured ribs tearing the pleurae or lungs or penetrating trauma.

The lungs may become bruised (pulmonary contusion) or they may become torn or cut (pulmonary laceration). Blunt force trauma may cause pulmonary contusions and, through the shear forces acting on the lungs, pulmonary lacerations. Penetrating trauma can cause pulmonary lacerations. The lungs are vulnerable to damage from explosion due to pressure waves (pulmonary barotrauma), and patients in the vicinity of an explosion may have traumatic injuries to their lungs in the absence of visible, external trauma. Damage to the lungs can inhibit gas exchange leading to shock.

A pneumothorax is the presence of air in the pleural space. A pneumothorax can be either traumatic or spontaneous. A spontaneous pneumothorax is caused by congenital weakness in the chest rupturing causing a pneumothorax. A traumatic pneumothorax may be caused by penetrating injury or the tearing of the pleura by a fractured rib. Traumatic pneumothoraces are categorized as open if there is passage of air from the outside environment into the pleural space, otherwise they are categorized as closed. An open traumatic pneumothorax is colloquially called a “sucking chest wound” due to sucking sounds as air moves through the opening. A hemothorax is the presence of blood in the pleural space.

A traumatic pneumothorax may create a one-way valve into the pleural space allowing air to enter the pleural space but not exit. As air accumulates and the pressure increases, the lung will collapse. Tissue may also bulge out from between the ribs. This increasing pressure will push the heart and large blood vessels towards the unaffected side. This is called a tension pneumothorax (Figure 16.4). As the pressure increases, pressure against the major veins decreases venous return and may cause obstructive shock. If the pressure increases above that of the blood pressure in the veins, blood will not be able to return to the heart, and the patient will enter cardiac arrest.

Signs and Symptoms

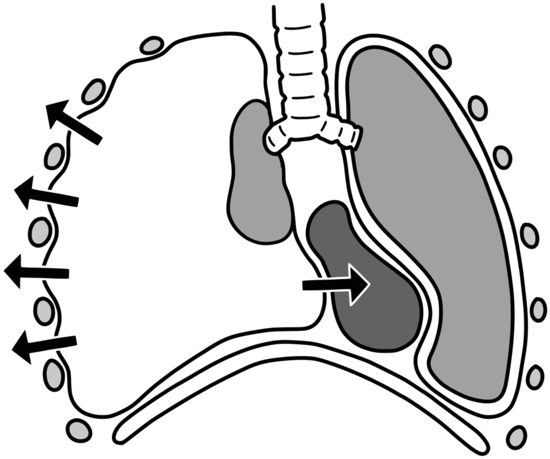
Signs and symptoms of lung injury are typically chest pain and shortness of breath.

Shortness of breath. Patients with lung injuries will have a shortness of breath accompanied by rapid, and shallow breathing. They may have chest pressure and may be in respiratory distress. Poor gas exchange may result in cyanosis, especially of the lips. This can be checked for by using a pulse oximeter.

Chest pain. A spontaneous pneumothorax will present with sudden chest pain and a shortness of breath. A traumatic pneumothorax may be harder to identify immediately as there may be other injuries that mask its presence.

Reduced signs of respiration. Both pneumothoraces and hemothoraces may present with reduced movement of the chest wall on the

Figure 16.4: Tension Pneumothorax[12]



affected side during respiration. When using a stethoscope, the sounds of breathing may be reduced on the side with the injury.

Signs of shock. Patients may go into shock due to blood loss into the pleural space, reduced gas exchange in the lungs, or obstructed blood flow to the heart. Signs of shock such as pale, cool, clammy skin and sweating may be present.

Signs of tension pneumothorax. If the patient has a tension pneumothorax, their trachea may deviate away from the affected side. Their veins on their head and neck may become distended. Tissue may started to bulge out from between the ribs. The patient may develop hypotension.

Other signs. The patient may be coughing up blood due to blood in the lungs and pleural space.

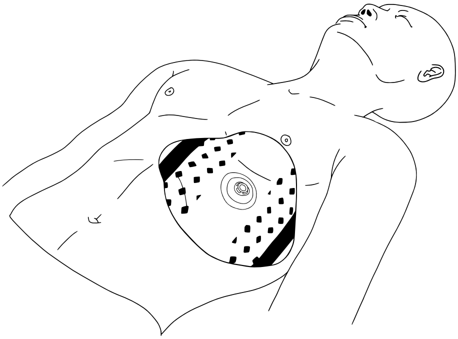
Treatment

Treatment for lung injuries is to manage a possible tension pneumothorax, treat for shock, and evacuate the patient.

Consider related injuries. If applicable, treat the patient for rib fractures and flail chest.

Lay patient on affected side. If the patient has a pneumothorax or hemothorax, have the patient lay on their affected side. Though painful, this will allow the unaffected lung to fully inflate thus delaying potentially lethal complications until they can be evacuated.

Figure 16.5: Application of a Vented Chest Seal[12]



Apply a chest vented seal. If the patient has an open chest wound, you can minimize the severity of a pneumothorax by applying a chest vented seal. If you do not have a commercial vented chest seal, an occlusive dressing can be improvised.

Note that a vented chest seal is specified. A non-vented chest seal can trap air in the pleural space either causing or exacerbating a tension pneumothorax.

Commercial vented chest seal. Commercial chest seals use extremely sticky adhesive that adheres to wet skin. Be cautious of letting the seal come in contact with itself or your gloves.

Use trauma shears to cut away the patient's clothing. Attempt to use gauze to dry to the skin around the wound to maximize adhesion between the skin and the chest seal. Remove the seal from it's packaging. Place the vent directly over the wound (Figure 16.5). If the there is both an entrance and exit wound, place the vented seal on the anterior wound to allow it to vent. The posterior wound may use a non-vented chest steal so long as a vented seal was used on the anterior wound. Press the seal tight against the skin to ensure an airtight seal.

Improvised occlusive dressing. A occlusive dressing can be improvised. Use a square piece of a plastic bag to cover the wound. Tape down three of the four sides to allow air to escape.

Avoid needle decompression. Unless you are trained to do so, do not use a chest decompression needle to vent air from a tension pneumothorax.[i] This can cause significant harm and complications.

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[i] This is mentioned because some medics claim to carry chest decompression needles (tension pneumothorax access kit, TPAK) in the event they encounter a pneumothorax.

Treat for shock. Reduced ability to breath, blood loss, and reduced venous return may lead to shock. Treat the patient for shock.

Evacuate. Lung injuries can be a medical emergency. SpO_2 under 95% requires monitoring the patient. Immediately evacuate patients to advanced medical care if they are in respiratory distress, show signs of a pneumothorax, are coughing up blood, or have SpO_2 under 90%.

Summary

Traumatic chest injury may be accompanied by rib fractures. Fractures should be stabilized. If multiple adjacent rib are fractured in multiple places, the patient may have flail chest and exhibit paradoxical breathing. This is a sign of flail chest and requires immediate evacuation to advanced medical care. Chest trauma of any sort, including explosions, can damage the lungs causing the patient to develop respiratory distress. Patients who are coughing up blood of exhibit signs of pneumothorax need immediate evacuation to advanced medical care. Patients with a traumatic chest injury who feel chest pressure, exhibit signs of respiratory distress, or have a reduced peripheral blood oxygen saturation need immediate evacuation to advanced medical care.

The treatment described in this section can mitigate a pneumothorax sufficiently until the patient can be evacuated, and an invasive procedure done by an untrained medic is medically unethical. The only reason you should carry a chest decompression needle is if you work with more qualified medics who are trained to use such a device.

17 : Fractures and Dislocations

> Therefore, the subject is not whether we accomplish Anarchism today, tomorrow, or within ten centuries, but that we walk towards Anarchism today, tomorrow, and always.
>
> Errico Malatesta, *Towards Anarchism*[106]

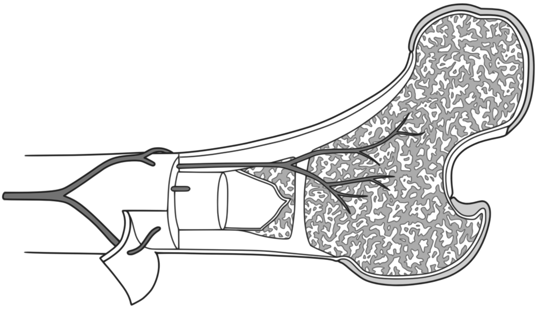
Fractures and dislocations are less common during actions than simple wounds or contamination with riot control agents. They require significantly more force than cuts and bruises, so they are less likely to occur unless the intent is to maim rather than simply to hurt or use pain compliance. They may be the result of police brutality, hand-to-hand combat, being hit by a vehicle, or even just accidents such as falling from a height. Most injuries of this nature are non-lethal, so being able to identify and immobilize fractures and dislocations will help minimize the amount of pain a protester has to endure before they can reach definitive treatment.

Physiology

The adult human skeleton consists of 206 bones whose functions include providing support for the body, facilitating movement, and protecting delicate organs. The skeleton is divided into the axial skeleton consisting of the skull, vertebral column, ribs, and sternum. The remaining bones make up the appendicular skeleton consisting of the shoulder girdle, pelvis, arms, and legs.

Bones are not solid. They consist of a hard outer layer (coritcal bone) that gives bones their smooth shape and provide the rigidity that allows bones to carry out their primary functions of support, movement, and protection. Inside the bones are canals that run parallel and perpendicular to the bone that allow blood vessels and nerves to reach inner tissues. Spongy bone (cancellous bone) is less dense and weaker but more flexible than cortical bone. It's functions include providing load distribution in long bones and producing platelets, red blood cells, and white blood cells.

Figure 17.1: Bone Cross-Section[12]



A joint is the connection between two or more bones. There are multiple types of joint when classified by function. Fibrous joints are fused, inflexible joints like between the bones of the neurocranium. Cartilaginous relatively immovable joints that joined by cartilage like the joint between the left and right pubic bones (pubic symphysis). Facet joints exist between the articular processes in adjacent vertebra, and they limit and guide motion in the spinal column. Synovial joints (Figure 17.2) are the most common kind of joint in the human body. They are a fluid filled cavity surrounded by a fibrous capsule that allows free range of motion. Examples of these are the wrist, shoulder, and knee.

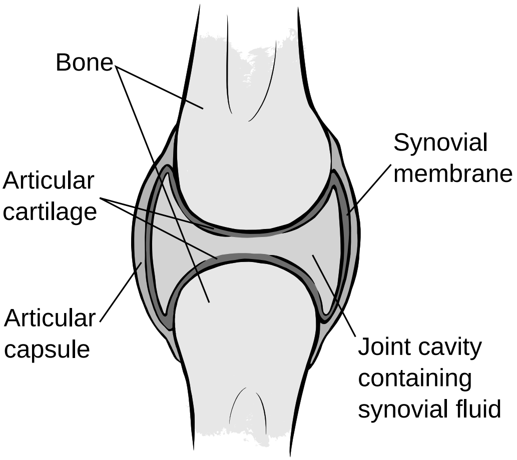
Ligaments are connective tissue that connects bone to bone. Ligaments can both guide and prevent movement. Ligaments are viscoelastic. They strain gradually under load but return back to their original shape when the load is removed. This is elasticity is not unlimited. Beyond a certain point they cannot return to their original shape leading to joint instability.

Tendons, also known as sinews, are connective tissue that usually connect a muscle to bone. Like ligaments, tendons can stretch under tension. Muscle contractions pull on the tendon which moves the bone it is connected to.

Fractures

A fracture is a break in the continuity of a bone. When a bone fractures, there may be edema or hematoma cause by ruptured bone marrow and

Figure 17.2: Synovial Joint[104]



damaged blood vessels. Blood vessels may become pinched, blocking blocking blood flow to an extremity.

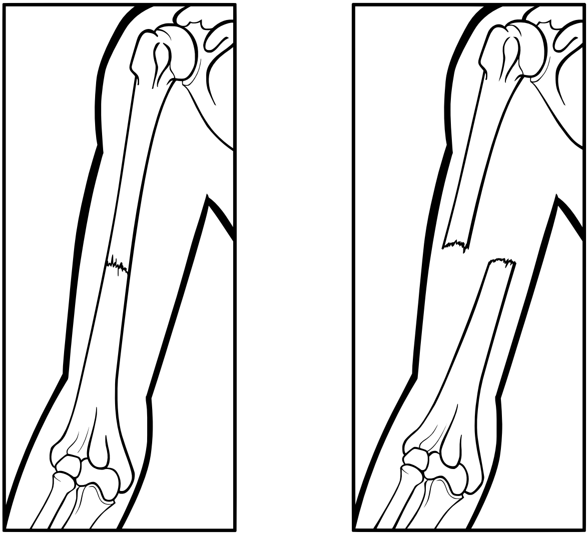
Fractures can be classified based on their origin. Traumatic fractures are caused by direct impact or other sudden forces. Pathological fractures are caused as a result of weakening of bones due to disease such as osteoporosis, though they may still be caused by comparatively small forces. Pathological fractures from osteoporosis may occur in the patients who are elderly, are alcoholic, or have anorexia nervosa.

Fractures can be classified as open or closed depending on whether or not they may be contaminated by the environment. A closed fracture is a fracture with no break in the skin. An open fracture is a fracture may have bone protruding from skin or it may have an open wound that communicates with the fracture or surrounding hematoma.

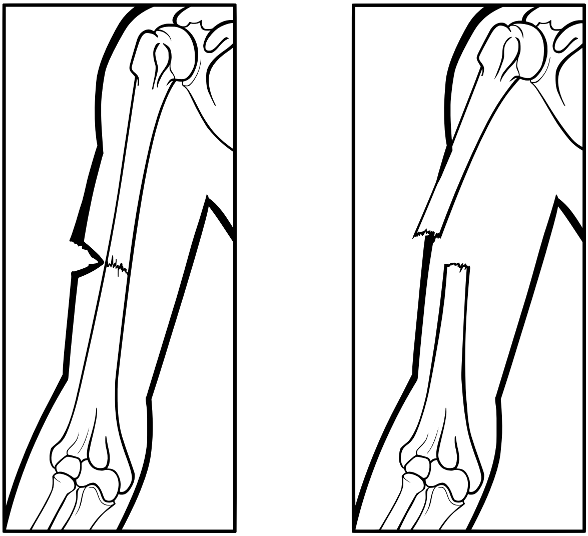
Fractures can be classified as displaced or non-displaced depending on whether the fragments have shifted relative to each other. Not all fracture result in a change in shape of the bone or extremity.

When a bone fractures, there can be significant loss of circulating blood. Estimations of these values for a closed fracture are listed in Table 17.1. These values can be double in open fractures. Class III hemorrhages (1500 to 2000 ml) are approximately when hypovolemic shock occurs. Hemorrhage classifications are discussed in Chapter 12 ("Wound Management").

Figure 17.3: Fracture Types[33]



(a) Closed/Non-Displaced (b) Closed/Displaced



(c) Open/Non-Displaced (d) Open/Displaced

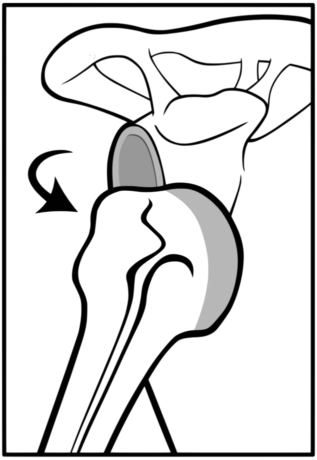
Table 17.1: Estimated Blood Loss from Fractures

Bone	**Blood Loss (ml)**
Rib	125
Radius or ulna	250–500
Humerus	750
Tibia or fibula	500–1000
Femur	1000–2000
Pelvis	> 1000, typically > 2000

Dislocations

A dislocation is the abnormal separation of the bones of a joint (Figure 17.4). Dislocations are typically caused by trauma, though some individuals may have congenital predispositions to dislocations and may experience dislocations with only minor force. Dislocations can cause damage to the tissue around the joint such as ligaments, tendons, nerves, and blood vessels.

Figure 17.4: Shoulder Dislocation[33]



Compartment Syndrome

Compartment syndrome is increased pressure within a fascial space. This increased tissue pressure eventually leads to ischemia. Compartment syndrome is a complication of injuries such a fractures, crush injuries, and burns, though it may also be caused by repetitive strain on a muscle or tight bandages.

The main signs and symptoms are worsening pain and pain that is out or proportion with the original injury. Pain is exacerbated by passive stretching of the affected muscles. Other signs include pallor or cyanosis of the tissue surrounding and distal to the compartment. Distal pulse may be absent. The patient may complain of a feeling of pressure, and the compartment may feel tense when palpated.

Use the 5 P's of critical limb ischemia to help identify compartment syndrome: pain, pallor, paraesthesia, paralysis, and pulselessness.

Table 17.2: The 5 P's of Critical Limb Ischemia

Pain
Pallor
Paraesthesia
Paralysis
Pulselessness

Compartment syndrome is a medical emergency for which there is no non-surgical treatment. The patient must be evacuated to advanced medical care.

Signs and Symptoms of Fractures and Dislocations

Signs and symptoms of fractures and dislocations are similar, and in many cases there is little utility in attempting to make a differential diagnosis between the two in the field. Dislocations may have associated fractures. In most cases, medical imaging is needed to confirm the diagnosis and guide treatment.

Signs and symptoms include pain and tenderness. There may be discoloration, either bruising or redness. There may be swelling or deformity of the appendage or joint. There may be crepitus (the sound of bone rubbing). An extremity may be moving in a way that seems unnatural. There may be stiffness, loss of range of motion, and loss of strength. The distal pulse may be weak or absent due to pinched or damaged blood vessels.

Assessment

Assessment of a fracture or dislocation is done to differentiate a body part with a fracture or dislocation from a body part that is merely bruised, strained, or sprained. If you suspect a head or spinal fracture, you need to immobilize the patient and take additional precautions. If you suspect a rib fracture, you need to check for complications and damage to the heart and lungs. See Chapter 15 ("Brain and Spinal Cord Injuries") and Chapter 16 ("Chest Injuries") for more information.

Consider MOI. Assess the mechanism of injury to determine if there may have been sufficient force for cause a fracture or dislocation. If the MOI does not seem to indicate dislocation but you suspect it, ask the patient if they have hypermobility or have dislocated that joint before.

Check for deformity. Expose the injured body part and check for deformity. Humans are bilaterally symmetrical, so the opposite body part may be used for comparison. Start by doing a visual comparison. This may be insufficient due to bruising such as in cases of police brutality. You may need to feel for deformity. Do so gently at first as this may cause significant pain.

Check extremity for CSM. Check the extremity for circulation, sensation, and motion to determine if there may be a pinched or severed blood vessel. Skin should be warm and pink. Check for a pulse distal to the injury. Cyanosis, cool skin, or lack of a pulse suggest pinched or damaged blood vessels. This is an emergency, and the patient requires immediate evacuation to advanced medical care.

Note that police are taught to target nerve groups with their batons to cause transient neurapraxia. This is a temporary loss of strength and sensation while the nerve is stunned. This disability typically lasts under 5 minutes, so sensation and motion may need to be rechecked to confirm your diagnosis of a fracture or dislocation.

Treatment

Treatment involves immobilizing the affected body part and evacuating the patient. Definitive treatment for fractures and dislocations should generally be done by a medical professional in a clinical setting. Attempting to set a bone or dislocation yourself can further damage tissue. Failure to properly set a bone can lead to malunion or nonunion. However, there are some cases where treatment in the field is appropriate.

Remove tight clothing and jewelry. Tight clothing and jewelry can constrict blood vessels if there is swelling around the fracture or dislocation. Remove jewelry and clothing. Depending on the nature of the injury, clothing may need to be cut away.

Clean and dress wounds. Wounds need to be cleaned and dressed prior to splinting. Exposed bone should be irrigated, but do not scrubbed. Wrap exposed bone with gauze soaked in water or saline. Tightly wrapping wounds should be avoided as swelling may cause constriction.

Consider in-line traction. In-line traction can reduce pain during splinting and make transport easier. Consider applying in-line traction or reducing the fracture or dislocation before splinting the injury. In-line traction and reduction are covered in detail later in this chapter.

Immobilize the injury. Immobilize the fracture or dislocation before moving the patient. If the patient is being evacuated by ambulance, and the arrival is expected to be prompt, significant immobilization efforts may be unnecessary.

Splint the bones above and below a dislocated joint. Splint the joints above and below a fractured bone. If you cannot differentiate between a fracture or dislocation and a less serious injury like a sprain or strain, it is preferable to splint to prevent additional pain and tissue damage. Splinting techniques are covered later in this chapter.

Check CSM. After splinting, and periodically during evacuation, check the patient’s CSM distal to the splint. Swelling may impair circulation, and dressings or splints may need to be loosened. Consider if impaired CSM is due to compartment syndrome.

Treat for shock. Patients with fractures and dislocations may go into shock due to pain or internal bleeding. This is especially true for fractures of the femur and pelvis.

Use the PRICE method. Protection, rest, ice, compression, and elevation (PRICE) can reduce pain and help prevent swelling. Generally, evacuation is done quickly, so there is neither time nor space for this treatment. During prolonged evacuations from remote actions, this may be advisable. PRICE is covered in more detail in Chapter 18 (“Athletic Injuries”).

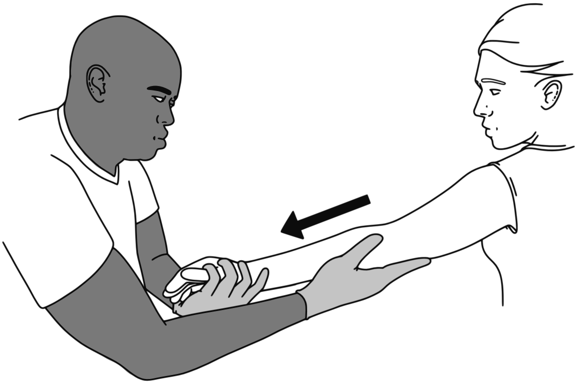
Consider evacuation. Depending on the nature of the action, even minor fractures and dislocation that you are able to treat can pose risk to the patient, so patients may need to be send home. Patients with fractures to the femur or pelvis, with multiple fractures, with degraded of absent CSM, or who may be in shock should be immediately evacuated to advanced medical care.

In-Line Traction

First aid courses often teach to immobilize a fracture or dislocation as it was found to prevent damage to tissues. Riot medicine takes after wilderness medicine where there is consensus that gently applying traction and attempting to straighten a fracture or dislocation can reduce pain and make splints more stable.[98] In-line traction should be applied for femur fractures, fractures that are difficult to splint due to angulation, and fractures or dislocations that impair distal CSM.

In-line traction for fractures is best applied by two medics, though it can be done by one (Figure 17.5). The first medic stabilizes the limb above the fracture, and the second medic grips the limb below the fracture. The second medic gently pulls the limb along the long axis of the bone and attempts to align the bone ends. When there is resistance or the patient experiences pain, stop and splint the limb in its current position.

Figure 17.5: In-Line Traction[12]



Reducing Dislocations

Treatment for a dislocation is called reduction.[i] Dislocations should only be reduced if transport to advanced medical care will take hours or if circulation is impaired and prompt evacuation is not possible. Reasons to consider reduction in the field is that it reduces pain and swelling and makes transport easier. Most actions being urban and suburban means that advanced medical care is close by, eliminating the need to reduce dislocations in the field.

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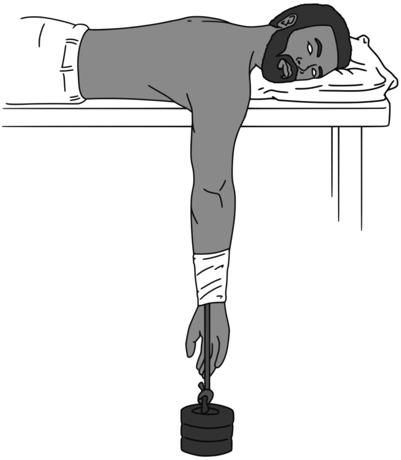
[i] *re* ("back [to initial position]") + *ducere* ("lead/bring")

In-line traction can also be used to reduce certain types of dislocations. Dislocations of the anterior shoulder,[ii] patella (kneecap), finger, or toe can be reduced with in-line traction. Other dislocations such as the wrist, ankle, hip, knee, and elbow should not be treated in the field unless there is impaired CSM or evacuations in excess of several hours. These are more complex, and there is risk of harm if medics attempt reduction.

In all cases, medics should use discretion when considering field reduction of dislocations.

Reducing shoulder dislocations. Shoulder dislocations can be identified by shoulder deformity or a "drooping" shoulder. An anterior shoulder dislocation can be reduced by having the patient lie face down on an elevated surface with their arm hanging freely (Figure 17.6).[iii] Attach a 2 to 5 kg weight to their hand or manually apply a very small amount of traction to the patient's arm to help relax their muscles. Maintain this traction until their shoulder pops back into place.

Figure 17.6: Passive Shoulder Traction



Splinting

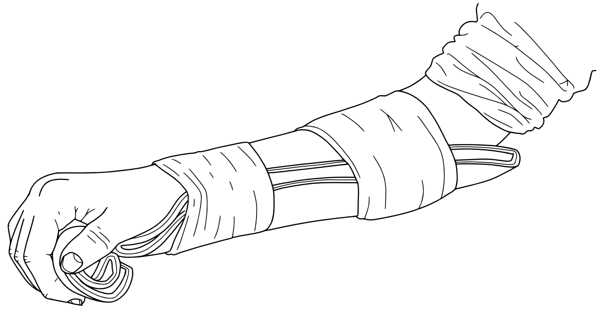
The primary function of splinting is to immobilize, support, and protect a fracture or dislocation. A good splint pads the injury and allows medics to checks distal CSM during evacuation. The support for a splint can be a commercial foam splint, piece of cardboard, piece of a foam sleeping pad, or other improvised adjuncts.

[ii] The shoulder "popping out" to the front

[iii] This is also known as the Stimson technique.

Foam splints can be molded to the shape of the extremity. Other splints should be padded with gauze or strips of cloth to conform to the shape of the body. Splints are held in place using triangle bandages, gauze rolls, self-adhering bandages, webbing, or tape.

Figure 17.7: Splinting an Arm[12]



Techniques

The following are techniques for treating specific fractures and dislocations.

Fingers. Fingers can be splinted individually using commercial or improvised splints. Another technique is buddy taping where the injured finger is taped to an adjacent finger for support (Figure 17.8a). When buddy taping, place gauze between the fingers to prevent chaffing and maceration.

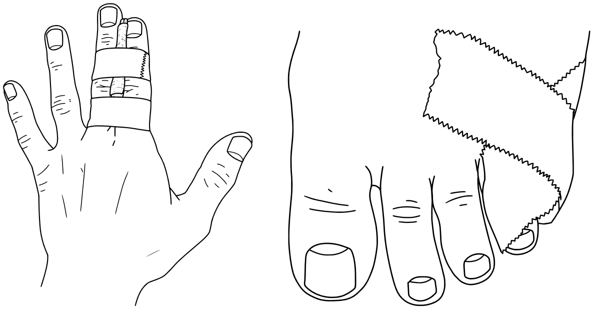
Toes. Toes are buddy taped in much the same way fingers are (Figure 17.8b). Additionally, user a long strip to tape the toes to the top of the foot to provide support. This is especially important if the pinky toe is injured. Because the toes are small, you may need to cut your strips of tape in half lengthwise.

Hand. Injuries to the hand that are not limited to the fingers require splinting the wrist. Splint the hand in the position of function. This is slightly open as when the hand hangs freely when at one's side.

Arm and shoulder. Slinging and swathing is used to immobilize the arm and shoulder (Figure 17.9). This is particularly useful for clavicle fractures.

Sling. A sling can be made using a triangle bandage. Hold the triangle bandage up to their chest so that the longest side is vertical and

Figure 17.8: Buddy Taping[12]



(a) Finger (b) Toe

opposite the side with the fracture. Have the patient place their hand on their breast. Pull the top corner around the back of their neck and tie it to the bottom corner. The third corner should be approximately at their elbow with enough extra material to make a flap. This flap will cup their elbow and prevent their arm from sliding out of the sling. Fold this flap around their elbow and use safety pins to secure the flap. Alternatively, use a long strip of duct tape to secure the flap.

Swathe. Use a second triangle bandage, strips of cloth, or webbing to secure the arm to the patient's torso. Injuries to the elbow may make it impossible to sling and swathe, so you may need to improvise immobilization.

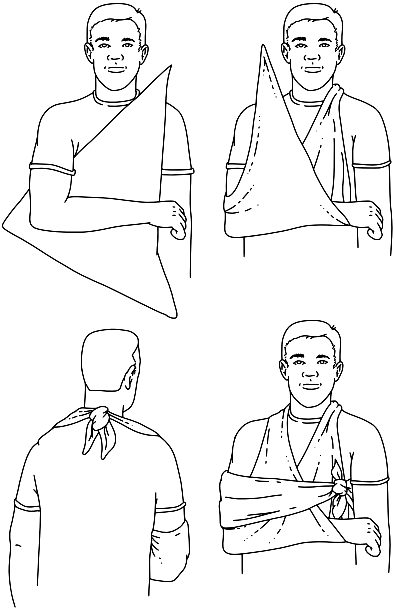
Pelvis. A fracture pelvis is a medical emergency. Treat a fractured pelvis like a spinal injury. Immobilize the torso and legs, and treat for shock. To immobilize the pelvis, tie a jacket around the patient's pelvis, and hold it in place using webbing or multiple interlocked belts.[iv]

Hip and femur. Fractures and dislocations of the hip and femur can cause painful muscle contractions. The entire leg and pelvis need to be immobilized with a splint. Improvising a traction splint it not recommended.[v] They are difficult to improvise, have contraindications for certain types of fractures, and are not well supported by medical evidence.[98]

[iv] Commercial pelvis slings are too large, heavy, and expensive to make sense for medics to carry.

[v] A traction splint is a device that is anchored above and below the site of the fracture and allows constant traction to be applied to the fracture. A traction splint for a femur anchors to the upper thigh or pelvis. The ankle is strapped to a rod that

Figure 17.9: Sling and Swathe[12]



Knee. Minor dislocations of the knee can be supported by an elastic bandage. With assistance, a patients may be able to walk and assist in their own evacuation. For more severe dislocations, splint the patient's leg carry them out.

Ankle. Fractures and dislocations of the ankle may be indistinguishable from a sprain. The patient's ankle may be splinted or wrapped according to the steps in Chapter 18 ("Athletic Injuries").

Summary

Fractures and dislocations can be serious medical conditions that require treatment by advanced medical care to avoid permanent disability. Treatment is typically immobilization and evacuation, though some minor injuries may be treated in the field. Serious fractures may lead to hypovolemia due to internal bleeding, so patients need to be treated for shock. Fractures and dislocations can be confused with sprains and strains, so when in doubt, splint the extremity and evacuate.

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extends from the anchor. A winch is tightened to apply traction to the lower leg. Clearly it can be seen that such a device is too large to carry at most actions and that it is difficult to improvise one that functions adequately.

18 : Athletic Injuries

> My girl gave me a bolt cutter / We love to break in / We claim all the spaces they forgot they had taken
>
> P.O.S, *Bolt Cutter*[107]

Athletic injuries are injuries to muscle, tendon, and ligament caused either by trauma or overuse.[i] Often these are caused by during physical activities like running, climbing, and fighting, though they may be caused by accidents like tripping, falling, or simply lifting heavy objects. These injuries are not life-threatening on their own, but if there is rioting or street fighting, individuals with athletic injuries may be incapacitated and unable to avoid danger.

The physiology covered in Chapter 17 ("Fractures and Dislocations") is considered a prerequisite for this chapter.

Physiology

Sprained ankles are the most common athletic injury during actions. They are often related to falling or walking or running on uneven surfaces. The anatomy of the ankle is complex (Figure 18.1), but it is approximately correctly to say that there is a ligament connecting each pair of adjacent bones. Sprains are typically of the anterior talofibular ligament (ATFL) or the calcanofibular ligament (CFL). Sprains of the deltoid ligament is rare due to its strength. Large forces applied to the deltoid ligament are more likely to cause an avulsion fracture to the calcaneus (heel bone).

Sprains also are common in the wrist. They tend to be related to falling or injuries while fighting. Like the ankle, the anatomy of the wrist is complex (Figure 18.2), and it is again approximately correctly to say that there is a ligament connecting each pair of adjacent bones. Sprains of the wrist tend to be radial rather than ulnar.

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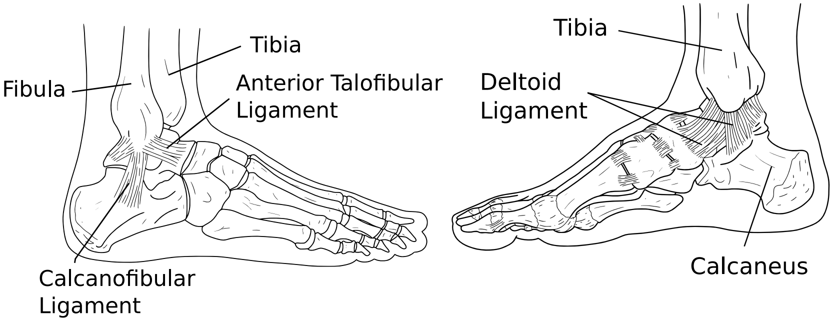
[i] Collectively, injuries to the muscle, tendon, and ligament are called soft tissue injuries (STI). These include strains, sprains, contusions, and tendinitis. Since this chapter focuses on acute and traumatic STIs, and since in this book contusions are covered by wound management, the term STI is not used.

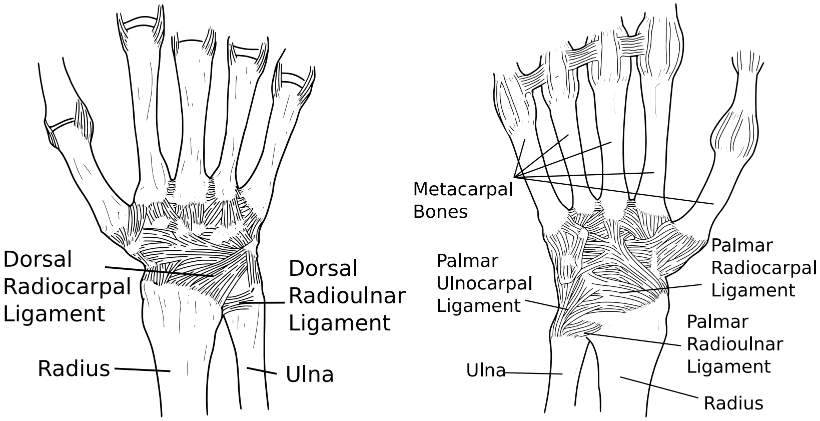
Figure 18.1: Anatomy of the Ankle[12]


Tibia
Fibula
Anterior Talofibular Ligament
Calcanofibular Ligament
Tibia
Deltoid Ligament
Calcaneus

(a) Lateral View

(b) Medial View

Figure 18.2: Anatomy of the Wrist[12]

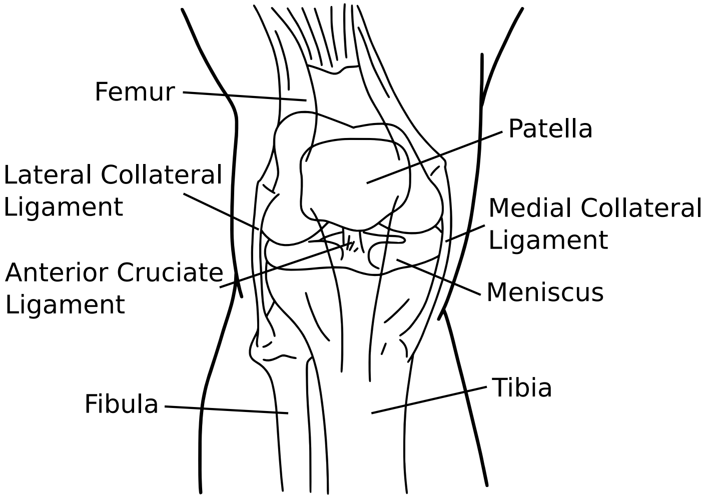

Dorsal Radiocarpal Ligament
Dorsal Radioulnar Ligament
Radius
Ulna
Metacarpal Bones
Palmar Ulnocarpal Ligament
Palmar Radiocarpal Ligament
Palmar Radioulnar Ligament
Ulna
Radius

(a) Dorsal View

(b) Palmar View

The knee (Figure 18.3) is another commonly sprained joint. Medics who participate in or follow sports are likely familiar sprains of the anterior cruciate ligament (ACL).

Figure 18.3: Anatomy of the Knee[12]


Femur
Patella
Lateral Collateral Ligament
Medial Collateral Ligament
Anterior Cruciate Ligament
Meniscus
Fibula
Tibia

Sprains

A sprain is an overstretched or torn ligament. It is caused by either trauma or the joint moving beyond its functional range of motion. Sprains may be mild and heal on their own within several days or they may involve a major rupture of the ligament requiring surgery. The equivalent injury to a muscle or tendon is called a strain.

Signs and Symptoms

Sprains are typically painful with swelling. They may rapidly develop edema from broken blood vessels. Bruising may occur shortly after the injury but may take several days to fully develop, and this bruising may not be localized to the injury. For example, a sprained ankle can lead to bruising of the toes. There may be an audible popping or cracking sound that accompanies the injury. Depending on the severity of the sprain, there may be joint instability, loss of range of motion, and an inability to bear weight.

Strains

A strain is an overstretched or torn muscle, tendon, or both. Strains, like sprains, may range from mild and quickly healing on their own to involving a major rupture and requiring surgery. Strains can be caused by improper body mechanics such as when lifting heavy objects. They can also be caused by overstretching a muscle such as when more force is applied against a muscle than the muscle can exert against that force.

Signs and Symptoms

Strains are typically painful and have localized inflammation or bruising. There may be loss of strength in affected muscle.

Tendinitis

Tendinitis is the inflammation of a tendon. Tendinitis may be caused by disease, but in the case of riot medics, it is caused by an injury, repetitive use, or overuse. Non-traumatic tendinitis is a progressive disease that typically develops over days or weeks, but there may be more rapid onset. For example, a poorly fitted or overly tight boot can rub against the Achilles tendon and cause tendinitis by the end of a single action.

Signs and Symptoms

Tendinitis typically presents with localized pain, redness, and warmth. Palpation and exercise may exacerbate the pain.

Treatment for Athletic Injuries

Treatment for athletic injuries is to immobilize, facilitate healing, avoid further injury, and manage the pain. The following methods can be used for immediate treatment, but they are not a substitute for surgery or physiotherapy.

Consider wrapping and splinting. If you cannot differentiate an athletic injury from a fracture or dislocation, assume the worst and immobilize it. Sprains that lead to an unstable joint, strains that lead to significant loss of function, or injuries with severe pain likely require advanced medical care.

Body parts can be wrapped to provide stability during evacuation and to protect them from further injury. Wrapping can also help with tendinitis. For example, wrapping a wrist can help minimize forearm tendinitis.

Consider use of NSAIDs. Use of NSAIDs can help reduce pain and swelling. If you carry them, consider suggesting the patient self-administer following the guidelines in Chapter 9 ("Medication").

Use the PRICE method. Treatment over the first 24 to 48 hours after injury used the PRICE method to minimize pain and swelling.

Table 18.1: PRICE Method

P	Protection
R	Rest
I	Ice
C	Compression
E	Elevation

Protection. The injured joint or muscle needs to be protected from further injury. The extremity may need to be immobilized or padded during evacuation.

Rest. The body needs rest to heal. This may mean bed rest for a strained back muscle, or simply avoiding using the injured extremity. A rule of thumb is that a patient should rest the injured body part until they can do simple activities without pain.

Ice. Ice helps minimize swelling. Whether or not this leads to faster healing is unclear, but it is useful for pain management. Ice can be applied for a maximum of 20 minutes per hour, allowing the injury to warm naturally between applications. Ice should not be placed directly against the skin. A towel or bandages should be placed between the ice and the skin. Excessive icing can lead to ischemia and frostbite.

Compression. Use of an elastic bandage for compression helps reduce edema and provides some immobilization. Use of inelastic bandages or tape for compression can impair blood flood. The extremity should be periodically checked for sensation, circulation, and motion.

Elevation. Elevating an injured limb above the heart helps reduce edema and associated pain.

Use the No HARM method. Along with the things pains should do to help with healing, there are also things they should avoid for the first 72 hours. The No HARM method is avoiding heat, alcohol, re-injury, and massage.

No heat. Application of hot packs or submersion in a hot bath should be avoided. Increased blood flow as a result of heat leads to increased swelling.

Table 18.2: No HARM Method

H	Heat
A	Alcohol
R	Re-injury
M	Massage

No alcohol. Consuming alcohol can increase blood flow leading to increased swelling. More importantly, it can decrease sensitivity to the injury leading to aggravation of the injury.

No re-injury. Related to resting, engaging in activities that could re-injure the body part should be avoided.

No massage. Avoid massages as they may cause additional tissue damage.

Consider evacuation. Resting and avoiding re-injury may mean that patients need to leave the action. A sprained wrist at a peaceful action does not require evacuation. At an action where there is expected confrontation with the State or fascists, patients with athletic injuries may need to be evacuated. Their injuries may prevent them from running from danger or fighting to protect themself. Recommendations for evacuation should be done at the medic's discretion.

Recommend light exercise. After the first 24 to 48 hours, light exercise helps promote healing. Ideally, the patient should seek physiotherapy, but in the absence of that, a general rule is to do light exercises that promote strength in affected body part. Recommend this to the patient.

Wrapping Techniques

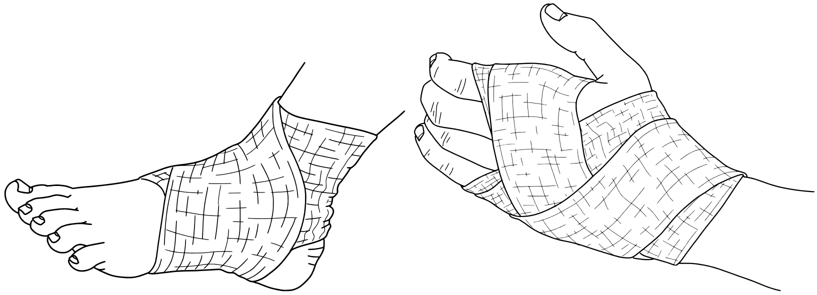
The following wrapping techniques can be used to provide support. A wrap should be snug (but not tight), provide support, and somewhat immobilize the joint. All wraps should be done with an elastic bandage or self-adhering bandage.

Wrapping an Ankle

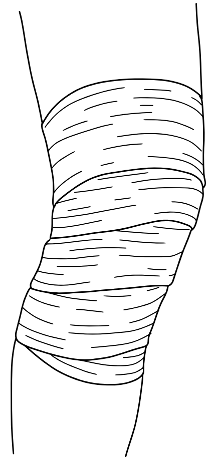
When wrapping an ankle (Figure 18.4a), the foot should be at a 90 degree angle to the leg. Start the wrap on the bridge of the foot, then make figure 8's around the ankle. Finish the wrap by wrapping around the Achilles tendon.

Depending on the length of your bandages, you may not be able to wrap the Achilles tendon. The most important part of the wrap is the figure 8's to stabilize the ankle.

Figure 18.4: Wrapping Joints[12]



(a) Ankle Wrap (b) Wrist Wrap



(c) Knee Wrap

Wrapping a Wrist

When wrapping a wrist (Figure 18.4b), the hand should be open, the fingers spread, and the wrist in line with the forearm. Start the wrap on the forearm, then make diagonal wraps up the hand. One wrap should fully wrap the palm of the hand to serve as an anchor. Make additional diagonal wraps back toward the wrist. Finish by securing the wrap on the wrist.

Wrapping a Knee

When wrapping a knee (Figure 18.4c), all wraps should be as close to the joint as possible. Because of the tapered shape of the quadriceps and calf muscles, wraps that are too far from the joint will slide back toward the joint and become loose. Start the wrap above the knee making two circles to act as an anchor. Make a diagonal wraps, crossing between the upper and lower leg on the back of the knee.

Summary

Athletic injuries are relatively easily managed without the need for advanced medical care, but they are debilitating enough to prevent patients from engaging in physical activity. Typically all that is needed is to wrap the injury and send the patient home. Patients should be instructed to be wary of lack of healing and a worsening state of the injury as this may be a sign of a fracture. When an athletic injury cannot be differentiated from a fracture, be conservative and treat it like a fracture. Discourage patients with athletic injuries from staying at actions where they may try to fight as this can cause severe re-injury.

19 : Burns

> Fire is catching! And if we burn, you burn with us!
>
> Katniss Everdeen, *Mockingjay*

Fire is a beloved tool of protesters worldwide, but it is an unpredictable weapon, and flames can injure those attempting to use it. Shrapnel from riot control devices can burn protesters, but not all burns are so dramatic. Hot liquids handed out at solidarity kitchens can burn someone when spilled. During an all-day action, protesters can get severe sunburns. Chemical burns and electrical burns, though less common, are still possible depending on the nature of the action and opposition.

The basic physiology of the skin discussed in Chapter 12 ("Wound Management") is considered a prerequisite for this chapter.

Types

There are four main types of burns: thermal, chemical, electrical, and radiation.

Thermal Burns

Thermal burns are burns caused by contact with hot objects such as open flame, heated metal, or steam. The length of time needed to cause a burn depends on the source of heat and duration of exposure. Water at 48 °C will burn skin in 5 minutes, and water at 59 °C will burn skin in 5 seconds.[98] Friction burns may also cause thermal burns aside from causing abrasion to the skin.

Chemical Burns

Chemical burns are burns caused by a corrosive agent such as an acid or base. They may also be caused by a cytotoxic agent (an agent that causes cell death) such as some types of spider venom. Possible causes are leaking batteries, un-ignited gasoline, or strong corrosive agents used as part of an "acid attack."

Electrical Burns

Electrical burns are burns caused by electricity passing through the body. This may be by direct contact with a live electrical object or by electricity arcing through the air. Electrical burns cause much more damage to subcutaneous tissue than thermal burns, and in some cases there may be little observable superficial damage. Arcing electrical shocks can cause blast injuries including trauma to the brain and lungs (barotrauma). Burns from high voltage sources can cause respiratory and cardiac arrest. Medics may see electrical burns from stun guns, electrified fences, or downed power lines.

Radiation Burns

Radiation burns are burns caused by radiation, or the transmission of particles or waves though a medium. In a protest environment medics, will likely only encounter sunburns. Burns caused by radio frequency radiation or ionizing radiation are unlikely to occur during actions.

Burn Size

There are two ways for estimating the total body surface area (TBSA) that has been burned.

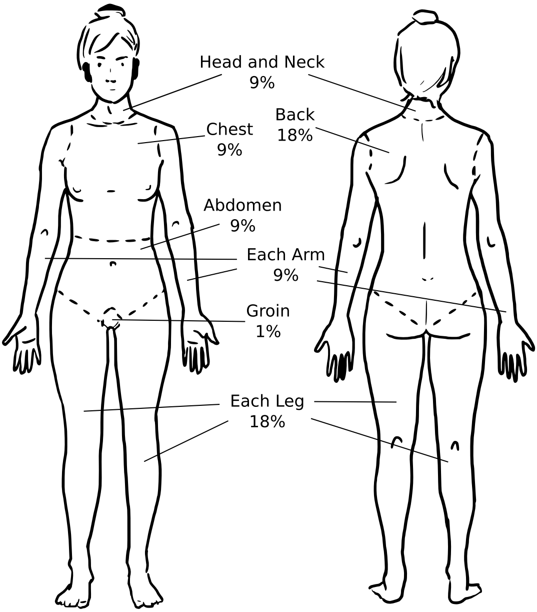
The first method is the Wallace Rule of Nines and is most accurate in adults of average body composition. The body is divided into regions that each comprise 9% of the TBSA. An illustration of the Wallace Rule of Nines can be seen in Figure 19.1, and a table of the values is in Table 19.1.

Table 19.1: Wallace Rule of Nines Values

Body Part	**Estimated TBSA**
Entire left arm	9%
Entire right arm	9%
Entire head	9%
Entire chest	9%
Entire abdomen	9%
Entire back	18%
Entire left leg	18%
Entire right leg	18%
Groin	1%

Another estimation technique is to use the patient's handprint with

Figure 19.1: Wallace Rule of Nines[71]



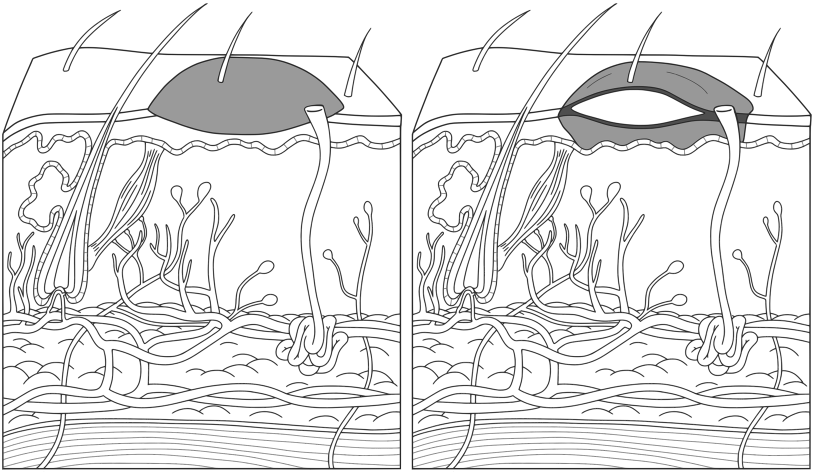
the fingers held together as 1% of the patient's surface area. This is reasonably accurate for both children and adults, but suffers the same deficiency as the Wallace Rule of Nines in patients with larger body proportions.

Burn Depth

Burns are characterized by the depth of the burn. Previous classification was to use degrees: first, second, third, and fourth. Modern classification uses the need for surgical intervention as its basis. This gives us new classifications: superficial, superficial partial-thickness, deep partial-thickness, full-thickness, and fourth degree.[80] The damage to the layers of skin in different burn depths can be seen in Figure 19.2. External characteristics of different burns can be seen in Figure 19.3.

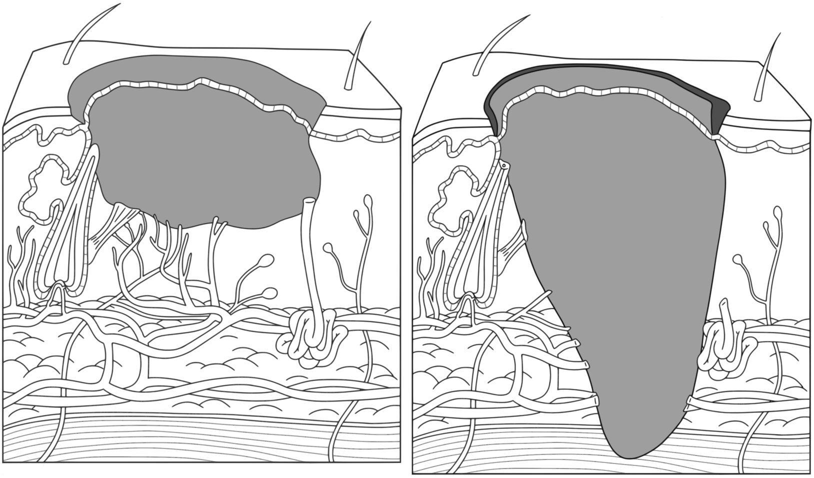
Burns are typically not uniform in depth. The center of a burn is likely deeper than the surrounding layers. For example, a burn caused by heated shrapnel may be a deep partial-thickness burn in the center and be surrounded by rings of superficial partial-thickness burn and superficial

Figure 19.2: Burn Depth[12]



(a) Superficial Burn

(b) Superficial Partial-Thickness Burn



(c) Deep Partial-Thickness Burn

(d) Full-Thickness Burn

burn.

Superficial Burn

A superficial burn (Figure 19.3a) is a burn that only involves the epidermis. The burn will be red, tender, and painful. The wound blanches white when pressure is applied. There is no blistering. A common type of superficial burn is a sunburn. Brief contact with small amounts of hot water will also cause superficial burns.

Superficial Partial-Thickness Burn

A superficial partial-thickness burn (Figure 19.3b) is a burn the involves the epidermis and the upper layer of the dermis leaving the hair follicles and glands undamaged. The skin is red and tender like in a superficial burn. This type of burn is the most painful. Additionally there is blistering. The dermis may be exposed, and if so it will be red and moist. The burn does not extend deep enough to damage capillaries, so the skin blanches white when pressure is applied.

Deep Partial-Thickness Burn

A deep partial-thickness burn (Figure 19.3c) is a burn that involves the epidermis and all layers of the dermis. Deep structures such as hair follicles, glands, blood vessels, and nerves are all damaged. This kind of burn may not be painful because of the damage to the nerves. The patient may describe the pain as pressure and discomfort. The skin does not blanch white when pressure is applied. The exposed dermis is white to yellow in color and is fairly dry. This type of burn is caused by exposure to flame of very hot liquids such as grease or steam.

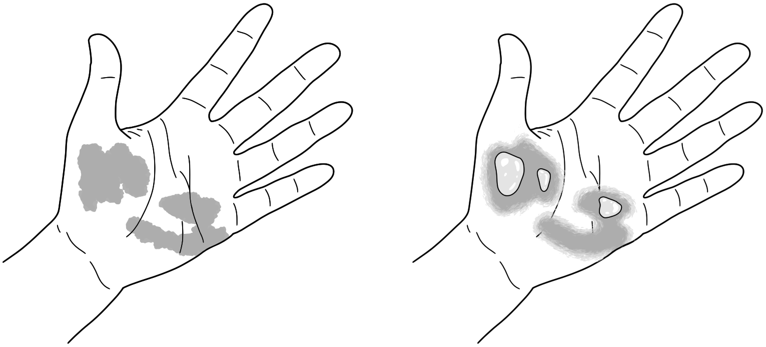
Full-Thickness Burn

A full-thickness burn (Figure 19.3d) is a burn that involves the epidermis, dermis, and subcutaneous tissues. The skin is stiff, is white to brown in color, and has a leathery texture. The skin may be charred. There is no pain as the nerves are completed destroyed.

Fourth Degree Burn

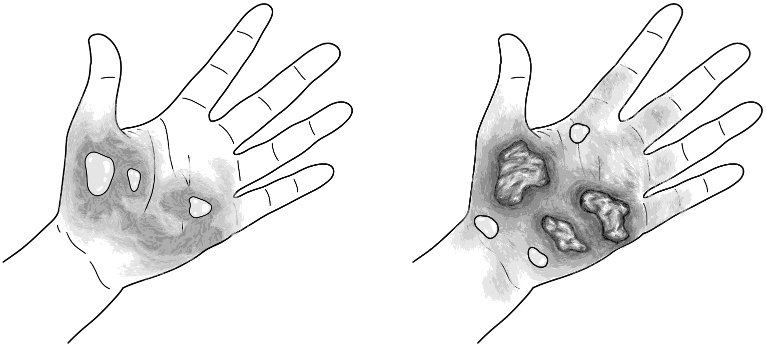
A fourth degree burn (Figure 19.3e) is a burn that extends all the way to the underlying bone and muscle. Burns of this depth are catastrophically damaging.

Figure 19.3: Burn Characteristics[12]



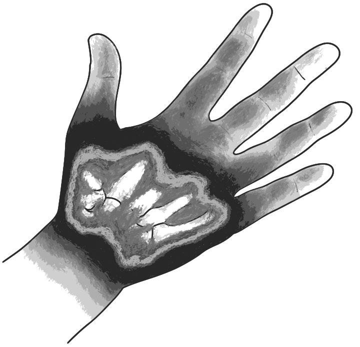
(a) Superficial Burn

(b) Superficial Partial-Thickness Burn



(c) Deep Partial-Thickness Burn

(d) Full-Thickness Burn



(e) Fourth Degree Burn

Burn Severity

The severity of a burn depends on the size, depth, and location of the burn as a well as the patient's age and the presence of complicating injuries. Table 19.2 shows a method for classifying the severity of burns. Major burns require treatment in a special burn unit. Moderate burns require hospitalization. Minor burns only require outpatient treatment. Outpatient treatment may mean treatment by advanced medical care, though in some cases medics may be able to treat these injuries on their own.

Table 19.2: American Burn Association Severity Classification[80,i]

Classification	**Characteristics**
Major	Partial-thickness $> 25\%$ TBSA, age 10–50 Partial-thickness $> 20\%$ TBSA, age < 10 or > 50 Full-thickness 10% TBSA Burns to hands, face, feet, or groin Burns crossing major joints Circumferential burns to an extremity Known inhalation injury Electrical burns Burns complicated by fractures or other trauma
Moderate	Partial-thickness 15–25% TBSA, age 10–50 Partial-thickness 10–20% TBSA, age < 10 or > 50 Full-thickness $\leq 10\%$ Suspected inhalation injury No characteristics of a major burn
Minor	Partial-thickness $< 15\%$ TBSA age 10–50 Partial-thickness $< 10\%$ TBSA age < 10 or > 50 Full-thickness $< 2\%$ No characteristics of a major burn

A burn that completely wraps around an extremity is called a circumferential burn. Circumferential burns can cause constriction that impairs circulation distal to the burn. Circumferential burns require advanced medical care.

Inhalation Injury

Inhalation injury occurs when a patient inhales hot air, particulate matter, or toxic gasses. Inhalation injury are most commonly seen with thermal burns, though they are also be caused by exposure irritating and toxic gasses such as cleaning agents.

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[i] This table was slightly modified to remove things not applicable to medics.

Hot gasses can damage and destroy the cilia and mucous membranes of the upper (and sometimes lower) respiratory tract. Particulate matter may reach the terminal bronchioles causing swelling and fluid to leak into the lungs. This can cause pulmonary edema (accumulation of fluid in the lungs) and bronchospasm (constricting of the muscles of airways of the lungs). Patients with inhalation injury from thermal sources may not develop respiratory distress for 24 to 48 hours, but patients who have inhaled smoke or toxic gasses may develop immediate symptoms.

Carbon monoxide has greater affinity for hemoglobin than oxygen. When carbon monoxide is inhaled, it displaces oxygen in the hemoglobin of red blood cells, reducing their ability to deliver oxygen. This displacement cannot be detected by a pulse oximeter. The reported SpO_2 will be artificially high in patients with carbon monoxide poisoning, and thus pulse oximetry cannot be relied upon for diagnosis.[80]

Inhaling smoke from burning wool, nylon, silk, vinyl, or plastic can lead to hydrogen cyanide poisoning. Hydrogen cyanide poisoning causes degradation of cardiovascular, pulmonary, and central nervous system function. Patients who complain of headache or have nausea may have inhaled toxic gasses.

Signs and Symptoms

Signs of inhalation injury are any burns to the face, singed facial or nose hair, or redness or soot in the airway. The patient may have an irritated or constricted airway and be coughing, wheezing, or have stridor. Stridor is a high pitched respiratory sound that is caused by turbulent air moving through constricted parts of the airway.

The patient may have carbon monoxide poisoning. Signs and symptoms are headache, nausea, vomiting, lethargy, and weakness. Patients may also have chest pain (angina pectoris), shortness of breath (dyspnea), impaired voluntary motor control (ataxia), syncope, seizures, and coma.

Inhalation of other toxic gasses often presents with nausea or reduced levels of consciousness.

Treatment

There are shared treatment principles for all types of burns as well as specialized treatments for each type.

General Treatment

The following steps generally apply to all burns.

Remove the patient from the source of the burn. Treatment of the patient cannot begin until they have been safely removed from the source of burn. This may mean removing them from a burning or smoke-filled building or getting them out of proximity of burning barricade. When considering rescuing the patient, ensure that you do not become injured yourself as this will prevent you from being able to provide aid.

Remove jewelry and clothing. Remove all jewelry and clothing at or near the burn site. If patient was burned by liquid that may have accumulated in their clothing or footwear, additionally remove these garments. Metal jewelry and accessories can retain heat and continue burning the patient. Watches, rings, and belts can act like tourniquets and cut off circulation. Jewelry and clothing at the burn site may trap heat or chemical agents.

Assess the burns. After stopping the burning and checking the patient's ABCs, make an assessment on the severity of the burns. Decide whether they need to be treated by advanced medical personnel, meaning anything above a minor burn. Minor burns may still require advanced medical care such a burns with material melted on to the skin.

Recommend advanced medical care. For both cosmetic reasons and to preserve functionality, patients with burns on their hands, feet, face, or groin should be promptly evacuated to advanced medical care.

Treat for shock and hypothermia. The burns may cause the patient to go into shock. Using water to extinguish flashes or flush chemicals from the patient may lead to hypothermia. Treat for shock and hypothermia while awaiting evacuation.

Specific Treatment for Thermal Burns

Treatment for thermal burns begins by stopping the burning, treating life-threatening injuries, then attending to the burn itself. Medics should not don examination gloves until after the fire is extinguished or other sources of heat are removed as the gloves may melt onto the skin of both the medic and patient. Work gloves should be used instead.

Stop the burning. If the patient or their clothing are still burning or smoldering, completely extinguish the fire ensuring no embers remain. This is often accomplished simply by "Stop, drop, and roll." Use a blanket, carry tarp, jacket, banner, or shirt to smother or beat the flames. Synthetic materials such as nylon or polyester may melt into the patient's skin if used and should be avoided for large flames, though they may be appropriate for smothering or swatting small flames. If there is a hot object such as a burning tear gas cannister or flare, you may need to use water to extinguish the source or heat.

Cool the burns. After extinguishing the flame, the residual heat may continue to burn the patient. Use cool water (18–25 °C) to quickly cool the wound. Using cold or icy water will cause vasoconstriction which reduces blood flow to already damaged tissue. Do not use ice as this may cause frostbite. Be mindful that using cool water on the patient may later lead to hypothermia.

Check ABCs. Check the patient's ABCs looking for signs of inhalation injury. If inhalation injury is suspected, evacuate the patient to advanced medical care. Treat life-threatening injuries while you are waiting for advanced medical personnel or before doing the evacuation yourself.

Clean and dress the burns. Irrigate the wounds to remove debris using the steps described in Chapter 12 ("Wound Management"). Do not remove material melted to the skin. Do not pop blisters. If a blister pops, gently pat the blister dry using gauze. If the patient is being evacuated, cover the wounds with dry dressings. If evacuation is delayed or the patient does not require advanced medical care, dress the wounds yourself. Apply antiseptic or antibiotic creme to the burns. Note that some irrigation solutions such as Prontosan may be sufficient in lieu of additional antiseptics. Wounds that are less than 3% TBSA can be covered with a wet dressing, otherwise use a dry dressing. If you carry them, used specialized burn dressings, or apply burn gels to gauze. Advise the patient to change the dressing daily until the burn heals and to seek advanced medical care if it becomes infected.

Recommend evacuation for minor burns. For all but the smallest burns, advise the patient to leave the action to prevent further damage, pain, and risk of infection. If there is fire at the action, there is a good chance that riot control agents (RCAs) have been or will be used. RCAs, especially pepper spray, is extremely painful on burns.

Specific Treatment for Chemical Burns

Chemical burns are caused by either dry (powder) or wet chemicals. In treating thermal burns, you were instructed to not put on examination gloves until the flames were extinguished as the gloves could melt to your hands. With chemical burns, you should put on gloves before removing the chemical to avoid transferring it to your body. After removing the patient from the source of the chemical and removing their jewelry and clothing, use the following steps to treat them.

Brush off dry chemicals. If the chemical is dry, brush off as much as possible using your hand or gauze. Some dry chemicals will react with water.

Flush with water. Flush the affected areas with water for at least 20 minutes. Flushing of the eyes may need to be done for in excess of 30 minutes. Since the most common chemical patients will become contaminated with is a form of RCA, detailed instructions for decontamination procedures, especially of the eyes, can be found in Chapter 13 ("Riot Control Agent Contamination"). These steps likewise apply to chemical burns. After flushing the eyes, cover them with affected eyes with a cool moist dressing.

Remove contact lenses. If the patient is wearing contact lenses and there is any possibility that the chemical got onto their face, they will need to remove their contact lenses. If their hands are clean and uncontaminated, they may be able to do this themself. If not, you may need to do this for them to prevent damage to their eyes.

Specific Treatment for Electrical Burns

Electrical burns may be dangerous to treat because of the invisible and unpredictable nature of electricity. Some burns, such as those caused by a stun gun or a brief shock are safe to treat as the source of the shock is quickly removed. Shocks caused by electric fences, exposed wiring, and especially downed power lines may make it impossible to safely rescue the patient. To preserve your safety and thus ability to keep treating other patients, you may not be able to rescue a patient.

Wet pavement, soil, or vegetation can conduct electrical current even from low voltage lines. This may lead to medics being shocked when approaching a patient. Patients who come in contact with a strong enough source of electrical current may not be able to let go or get away from the source because of uncontrollable muscle contractions known as the "no let go" phenomenon (tetanic contractions). If possible, use a wooden stick or bulky material without metal pieces to get the patient away from the source of shock. However, even with these precautions, medics may be shocked.

High voltage lines that do not appear to be live may still carry current, or they may become live again after a circuit breaker flips. This may cause the line to jump many meters. High voltage lines have no insulation, though the presence of dirt or charred material may give this impression. Electrical current may travel through the ground. Wearing shoes with rubber soles may not provide sufficient insulation to prevent shock even if the shoes are rated for resistance to electrical current. The minimum safe distance is 10 meters, and medics at this distance may still be at risk for lethal shock.

If an electrical line comes in contact with a vehicle, even after the power is cut, the vehicle may still retain charge. A medic attempting to enter the vehicle may complete the circuit with the ground and be fatally shocked. Likewise, patients in the vehicle should not exit the vehicle as this may complete the circuit with the ground and cause a fatal shock.

Once the patient has been removed from the source of electrical shock, check their ABCs. Treatment principles follow that of thermal burns with the following additional considerations. Electrical shock may cause respiratory or cardiac arrest. Arcing electricity may create a blast wave that may injury the patient leading to brain or lung injuries. See Chapter 15 ("Brain and Spinal Cord Injuries") and Chapter 16 ("Chest Injuries") for more information. Damage to muscle tissue from electrical current may lead to compartment syndrome. Treatment for this can be found in Chapter 17 ("Fractures and Dislocations").

Summary

Burns can come from a variety of sources, through most commonly medics will see thermal burns from open flames. The severity of a burn depends on its location, depth, and size. Some minor burns may be treated by a medic in the field, but many will require advanced medical care, even if for no other reason than pain management.

Medics attempting to rescue a patient from a source of heat, chemical contaminant, or electric shock need to prioritize their own safety. An injured medic cannot treat a patient, and their own injury becomes an additional drain on limited medical resources.

Treatment principles for burns begin with removing the source of the burn either by extinguishing flames or flushing away chemicals. Monitoring ABCs is crucial. Burns deeper than superficial to the hands, feet, face, or groin always require advanced medical care. Burns to the face indicate inhalation injury which requires advanced medical care. The skin protects the body from infection, and because a large amount of the dermis is exposed following a burn, there is high risk of infection. Patients who are not sent to advanced medical care need to have antibiotic creme applied to their wounds with the instructions to change their dressings daily and to seek advanced medical care if there are signs of infection.

20 : Combat Injuries

> When the people are being beaten with a stick, they are not much happier if it is called "the People's Stick."
>
> Mikhail Bakunin, *Statism and Anarchy*[108]

This chapter on combat injuries covers additional wound management techniques for more serious wounds and the particular types of injures seeing when confronting police, fascists, and the State. It additionally covers various types of less-lethal weapons used by the police. Due to their frequency of use and significant differences from other injuries caused by other less-lethal weapons, pepper spray and tear gas are covered in Chapter 13 ("Riot Control Agent Contamination"). The physiology and treatments in Chapter 12 ("Wound Management") are prerequisites for this chapter.

Less-Lethal Weapons

Less-lethal weapons are weapons that are either designed to be or marketed as being less lethal than traditional firearms or munitions. Commonly, these are weapons like stun guns, rubber bullets, and pepper spray.[i] Less-lethal weapons can be categorized according to use, either against people (anti-personnel) or against objects (anti-material). Discussion of anti-material less-lethal weapons is outside the scope of this book.

Use of long-range weapons allows police to enact violence from relative safety, both physical and psychological. The supposed non-lethal nature of such violence lowers the threshold for their use and due to the ease of justifying their use.[ii]

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[i] For a comprehensive review of less-lethal weapons, see *'Non-Lethal' Weapons* by Neil Davison.[109] For a shorter guide with a more anarchist perspective, see *Warrior Crowd Control & Riot Manual* by Sprout Distro.[110] It it also beneficial to browse the product lists, advertising materials, and trade show materials produced by weapons manufacturers. For example, the product list for the US company NonLethal Technologies, Inc. is quite informative (archive:[111] `https://web.archive.org/web/20191102214711/http://www.nonlethaltechnologies.com/pdf/NLT_Data_Sheets.pdf`).

A common characteristic of what makes less-lethal weapons "less lethal" is operator training and discretion, which is to say that their reduced lethality and reduced maiming of their targets is entirely dependent on police competency and lack of malice. Police are known for overzealous use of so-called "less-lethal" weapons and hatred of left-leaning protesters, so the damage done by these so-called "non-lethal technologies" or "less-than-lethal capabilities" can still be catastrophic and fatal. They will use such weapons intentionally incorrectly in order to injure and maim rather than to force dispersal. This may be by shooting tear gas cannisters directly at protesters or aiming for the face with pellets and rubber bullets in order to permanently blind protesters as "punishment" for the crime of daring to challenge authority and the status quo.[iii]

Categories

It is useful to categorize less-lethal weapons according to the technology used to produce the near-lethal effects. An overview can be found in Table 20.1.

Impact projectiles. Impact projectiles are a type of kinetic energy less-lethal weapon. They include beanbag rounds, foam bullets, sponge bullets, fully rubber bullets, rubber-coated metal bullets, or plastic pellets (Figure 20.1). They may be fired from normal or modified gun, 40mm launchers, or ARWEN 37 launchers. These firearms may or may not be marked with neon-orange to differentiate them from their more lethal counterparts. Impact projectiles may also be used via "stinger" grenades filled with rubber balls. Injuries include welts, bruising, broken skin,

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[ii] Neil Davison argues what many of us instinctively know, that the term "non-lethal" is just PR given that such weapons are not non-lethal and that the very idea that they *aren't* lethal permits their use.[109] I would also argue that cops feel, on the average, more comfortable pepper spraying us than shooting us, and that as a result less-lethal weapons contributes to violence, but there don't seem to be studies that exactly prove this point. Stun guns (as an analogue for all less-lethal weapons) indicate that police are overly eager to use less-lethal weapons.[112–114]

[iii] In 2018 in Portland, Oregon, police opened fire against antifascists counter-protesting the ultranationalist group Patriot Prayer and shot someone in the back of the head with a flashbang grenade as he ran.[115] The IDF has blinded many Palestinians in Gaza with rubber bullets and live rounds.[116] The Carabineros have blinded many Chileans during the unrest that started in 2019 in response to the increase in the metro fair.[117] There are many more examples in many more countries going back to the dawn of policing.

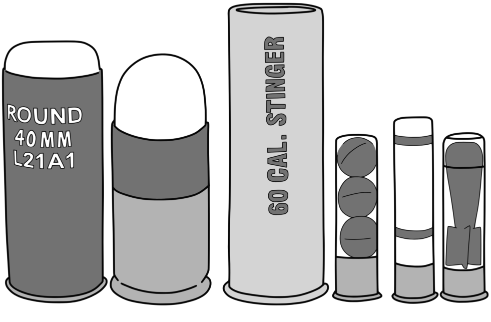
[iv] Skunk is a malodorant used by the IDF again Palestinians and other protesters.[118]

Table 20.1: Less-Lethal Weapons

Technology	Type	Examples
Kinetic energy	Impact projectiles Water cannon	Beanbags, pellets, rubber/sponge/foam bullets Vehicle mounted water cannons
Chemical	Riot control agents Malodorants Obscurants	Tear gas, pepper spray Skunk[iv] Smoke grenades
Electrical	Stun weapons	Stun guns, stun batons
Acoustic	Acoustic-optical Acoustic-generators	Flashbang grenades Ultra- or infrasonic noise devices, LRAD
Directed energy	Millimeter wave Laser (low-energy) Laser (high-energy)	Active Denial System Dazzlers or illuminators Pulsed Energy Projectile

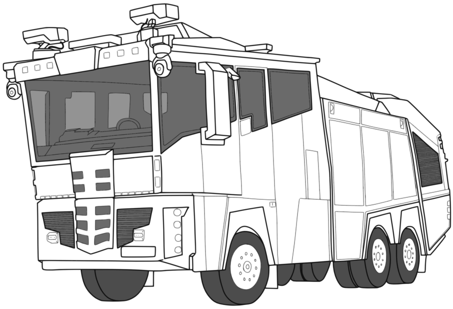
permanent eye damage, and permanent damage to testicles.[119] Due to their high muzzle velocity, and due to the difficulty of aiming them at a distance, injuries may resemble those of typical gunshot wounds[120]. This includes fractures, penetrating injuries, and death.

Figure 20.1: Impact Projectiles[12]



Water cannons. Water cannons are a type of kinetic energy less-lethal weapon (Figure 20.2). They are typically mounted on large, specialized vehicles (which themselves are simply called "water cannons"). The water may be mixed with riot control agents (further discussed in Chapter 13). Water cannons can knock down protesters, push them once they are down, and cause permanent damage to the eyes.[121] Internal injuries, fractures, and death from the force of the water are possible.[120,122]

Figure 20.2: Water Cannon[12,v]



Malodorants. Malodorants are a type of chemical less-lethal weapon. Their strong, unpleasant smell may cause gagging and vomiting. Their use is designed to cause "voluntary" dispersal from an area. The scent binds to targets and may persist for days. Malodorants are often deployed by vehicles similar to, but smaller than, water cannons.

Obscurants. Obscurants are a type of chemical less-lethal weapon. They create a large amount of smoke to decrease vision of protesters. They are often deployed by grenades. Use of smoke grenades is often confused with use of tear gas, and protesters may claim the effects of tear cause is present when it is not really the case. Obscurants typically do not cause primary injuries, but they may incite panic and cause secondary injuries from a stampede.

Stun devices. Stun devices (stun guns, stun batons) are a type of electrical less-lethal weapon. These devices may be handheld and require direct contact with the target, or they may fire barbs with attached wires allowing the operator to shock the target from a distance of roughly 6 m.[123] Stun devices can cause electrical burns as a primary injury as well as secondary injuries caused as result of falling. Stun guns (Figure 20.3) additionally cause puncture wounds from the barb and may cause thermal burns from the target catching fire.

Electrolasers. Electrolasers are a type of combined technology less-lethal weapon that use both directed energy and electrical current. Such devices use lasers to form an electrically conductive laser-induced plasma channel (LIPC) though which an electrical current is sent to shock the target. Electrolasers exist and have non-combat uses such as studying

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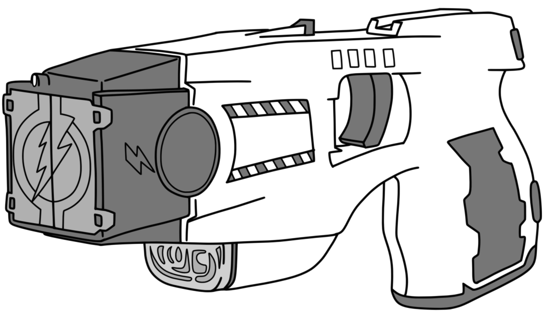
[v] This model is a German Wasserwerfer 9000 (literally "water thrower") with 9000 referring to the capacity of its 9000 L tank.

Figure 20.3: X26 Taser[12]



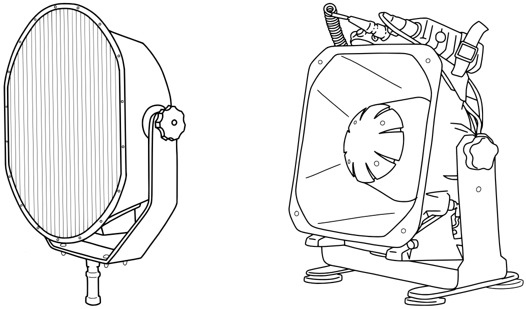
lightning. They are not currently in use as less-lethal weapons, but they are mentioned nonetheless as they may become relevant in the future.

Shock rounds. A shock round is a type of combined technology less-lethal weapon that use both kinetic energy and electrical current. Shock rounds are fired at targets like other impact projectiles, and upon striking the target release stored electrical charge. Such rounds are still in prototype phases, so like electrolasers, they are only mentioned for completeness.

Flashbang grenades. Flashbang grenades are a type of acoustic-optical less-lethal weapons. When these grenades detonate, they create a bright flash and a loud noise (over 170 dB[109], as high as 180 dB[120]) that is designed to disorient protesters. While it is not in their official use, police seem to use them both as weapon for collective punishment and to cause terror. Use of flashbang grenades causes temporary blindness, loss of hearing, and loss of balance. Primary injuries include trauma from the explosion or shrapnel, burns, and permanent damage to vision or hearing. Flashbang grenades additionally may cause blast injuries.[120] Secondary injuries include trauma from stampede.

Long range acoustic devices. Long range acoustic devices (LRAD [a name brand]) are a type of acoustic-generator less-lethal weapon (Figure 20.4). An LRAD can be used for long range commination (voice mode) and as a weapon (tone mode). They also come in varieties from large, more powerful vehicle mounted devices to smaller, less powerful portable devices. Large model LRADs can output sound at 159 dB at 1 m from the device. The human threshold for pain is 130 dB, and researchers recommended the devices not be used in tone mode for distances under 75 m due risk of injury.[109,vi] Primary injuries include temporary and permanent hearing loss as well as temporary loss of balance.

Figure 20.4: LRAD Models[12]



(a) LRAD 1000Xi (b) LRAD 100x

Millimeter wave. Millimeter wave devices are a type of directed energy less-lethal weapon. They operate by emitting extremely high frequency (EHF) radio waves that heat a target. The Active Denial System uses 3.2 mm waves to excite the water molecules of the target using the same principles as a microwave oven. This causes burning pain on the skin and may cause thermal burns and blisters. Such technology exists but is not used as this time as a weapon against protesters.

Dazzlers and illuminators. Dazzlers and illuminators are types of directed energy weapons. They are either exceptionally bright lights or low energy diode lasers that temporarily blind protesters. Dazzlers and illuminators may flash which may cause epilepsy. At sufficient distance, dazzlers will only cause targets to avert their eyes, but at closer ranges they may cause permanent damage.[123] Their main use is psychological and to deter advance. Protesters cannot look directly at police while approaching them which makes them more susceptible to injury from other weapons or arrest.[vii]

Pulsed energy projectile. The pulsed energy projectile (PEP) is a directed energy less-lethal weapon.[viii] The PEP fires a laser at the target, ablating the surface into plasma. The plasma creates an

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[vi] LRADs at this time were cited as having a maximum output of only 151 dB, so it is safe to say that the 75 m recommendation is likely not sufficient to protect hearing with modern devices.

[vii] Luckily, cheap lasers can be used by protesters against the police (officers, helicopters, drones) in exactly the same manner. Protesters in Egypt,[124] Hong-Kong,[125] and Chile[126] (among other locations) have used them to varying degrees of success.

ultrasonic pressure wave that passes into the target knocking them down and stunning them. Additionally, electromagnetic radiation causes pain in nerve cells.[127,128] The PEP, while intended for riot control, is not deployed at this time.

Injuries from Less-Lethal Weapons

The following injuries may occur from a variety of less-lethal weapons.

Eye Injuries

Dazzlers may burn the structures of the eye leading to blindness. Traumatic eye injuries may be caused by impact projectiles such a rubber bullets, bean bag rounds, and pellets. They may also be caused by rubber balls in stinger grenades, shrapnel from other explosives, water cannons, or pepper balls.

Signs and Symptoms. Patients exposed to dazzlers or flashbang grenades may have reduced vision or see splotches of color. Trauma to the eye may include bruising of the orbit, subconjunctival hemorrhage, or obvious destruction of eye tissue.

Treatment. Patients who have been temporarily blinded by dazzlers or flashbang grenades may be able to return to the action. Patients with persistent blindness should be be sent home and told to see a doctor for followup.

In patients with traumatic eye injuries, do not attempt to remove foreign objects. For minor injuries, apply a cold compress and instruct the patient to see an optometrist for a followup. For more severe injuries, place a gauze compress over the eye and avoid applying pressure as this may be painful. The patient may need immediate surgery. Evacuate the patient to advanced medical care.

Ear Injuries

Patient's may have their ears injured by a number of means such as pyrotechnics, flashbang grenades, or LRADs. Ear injuries include damage to the hairs of the cochlea used for sensing sound and balance. It may also include traumatic perforation of the tympanic membrane (ruptured

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[viii] The PEP was originally called the "pulsed impulsive kill laser"[127] in case you're wondering exactly how "non-lethal" turning someone's skin into exploding plasma actually is. This is one place in this book where I'm being "anti-scientific" and directly contradicting what's written in research papers on the subject and claiming that such technologies are more harmful than scientists say. However, I don't trust my malevolent tormentor when they make claims about what is or isn't going to injure me and my comrades.

ear drum). Perforation of the tympanic membrane by a loud noise is known as acoustic trauma.

Signs and symptoms. Patients may have reduced hearing, a loss of hearing, or tinnitus (ringing in the ears). They may have sharp ear pain. They may have a reduced sense balance, dizziness, or vertigo. Explosions leading to perforation of the tympanic membrane may cause bleeding from the ear.

Treatment. Vertigo can be partially treated by comfortably positioning the patient and minimizing movement. Bleeding and other drainage from the ear should not be stopped or blocked. The ear should be kept dry. Place a gauze over the ear. Do not place gauze or cotton swabs in the ear. This is a medical emergency that requires immediate evacuation to advanced medical care. All patients should be recommended to see an ear, nose, and throat (ENT) doctor as soon as possible for a followup and possible surgery. Patients who cannot hear well or have loss of balance are at increased risk of further injury or arrest and should be sent home or evacuated with assistance.

Thin, clear drainage from the ears may be cerebrospinal fluid which indicates a traumatic brain injury. If the mechanism of injury suggests that the patient may have a traumatic brain injury, treat it as such as they may be seriously injured. Evacuate them to advanced medical care.

Electrical Weapon Injuries

Electrical weapons such as stun guns and stun batons can lead to cardiac and respiratory arrest. They may cause flammable material to ignite causing burns. Barbs from stun gun darts may remain embedded in the skin.

Treatment. Check the patient's ABCs. If the barbs are still in the patient,[ix] place one hand on the skin around the entry site, firmly grip barb with the other, and pull the barb out with a single, quick motion. Ensure the barb did not break off or remain in the skin. Treat the wound as you would puncture wounds.

Injuries from Police Brutality

Police brutality comes in many forms such as failure to de-escalate,[x] excessive use of force during confrontations or arrest, and use of pain compliance and stress positions. Injuries may come from overt violence such as when police tackle or beat individuals, but it may also come from less obvious means such as handcuff injury.

[ix] There are not many cases where a patient would be tased and not under arrest.

Dog Bites

Police may have canine detachments with attack dogs that are used to intimidate protesters and subdue individuals for arrest. Dogs are often trained to bite once and hold, but individuals may have multiple bites. Dog bites can lead to puncture wounds, lacerations, crushed bones, and damaged muscles, tendons, and nerves. The bacteria in a dog's mouth can lead to infection including MRSA.

Treatment. Treatment for dog bites similar to that of other lacerations or puncture wounds. Wounds should be cleaned with water and a mild antibacterial soap then thoroughly irrigated. A difference to other wounds is that not all bite wounds should not be initially closed.[129] Bites that are appropriate to close are lacerations on the face and scalp, wounds that do not extend into subcutaneous tissue, wounds with simple characteristics, wounds without underlying fracture.[80] Additionally, wounds should not be closed in immunocompromised patients. Fractures should be treated as described in Chapter 17 ("Fractures and Dislocations").

Handcuff Injuries

Handcuff injuries are injuries that occur as a result of being handcuffed. Injuries from handcuffs themselves include blunt force trauma (bruises, abrasion, soft tissue injuries) and handcuff neuropathy.[130] As a result of being brutalized while wearing handcuffs, patients may have fractures of the wrist or dislocated shoulders because of the large amount of torque applied to these joints.

Handcuff Neuropathy

Handcuff neuropathy is neuropathy of the hand caused by compression of the superficial branch of the radial nerve. This is the most commonly affected nerve, but other nerves of the wrist may be affected.[131] Handcuffs may become over tightened during struggle or as a means of control. Metal handcuffs come with a double-locking mechanism to prevent additional tightening after they have been locked, but police may forget or "forget" to do this. Plastic handcuffs are often used for mass arrest. Some models lack double-locking mechanisms which allow additional tightening.

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[x] But we all know the purpose of the police is not to de-escalate, but to protect capital, so why would they want to do anything other than flex their monopoly on violence when they know they are legally untouchable?

Signs and Symptoms. Signs and symptoms of handcuff neuropathy include tingling or numbness (parathesia) and weakness.

Treatment. Remove watches, jewelry, or anything else that may constrict the patient's wrist. It is unclear if edema contributes to handcuff neuropathy or if it is caused by compression alone,[132] and as such NSAIDs are commonly prescribed. Consider administering NSAIDs following the guidelines in Chapter 9 ("Medication"). Apply cold compresses to reduce pain and swelling. The patient may need follow up from a physician, and symptoms may persist for months regardless.

Combat Medicine

While this chapter generally covers injuries described as "combat injuries," this section discusses injuries specific to combat and near-combat situations. These injuries are often seen when the intent is to kill, not simply to force dispersal via pain and fear. Medics should always ensure the scene is safe before approaching a patient, and this is of particular importance during combat scenarios.

Internal Bleeding

Internal bleeding is when damage to blood vessels causes blood to leave the circulatory system (decrease in circulating blood) and pool in body cavities. This may happen anywhere in the body such as in an extremity following a bone fracture or in the neurocranium as part of a traumatic brain injury. It may also happen in the abdomen or thorax which can lead to shock or dysfunction of many organs. Possible causes that are traumatic in origin include being struck by a police baton or vehicle.

Signs and Symptoms. Signs and symptoms of internal bleeding include signs of shock such as deceased blood pressure, weakness, pallor, and sweating. Other signs include dizziness, weakness, nausea, and abdominal or chest pain. Signs of abdominal bleeding include tenderness and pain during palpation.

Treatment. Treat the patient for shock. Immediately evacuate them to advanced medical care.

Stab Wounds

Stab wounds are traumatic penetrating injuries caused by sharp objects such as knives or broken bottles. Risk of stab wound at the hands of fascists and nationalists may exist at both large and small, non-militant gatherings.[xi]

Treatment. Treatment principles are the same as for puncture wounds as discussed in Chapter 12 (“Wound Management”). Use of hemostatic gauze is recommended as patients with stab wounds may bleed out (exsanguinate) and die in minutes. Stab wounds to the torso may be manged using a chest seal. Consider using a tourniquet on stab wounds to extremities. Patients may have multiple stab wounds that need to be treated simultaneously, and if so, begin with the most severe first. Treat the patient for shock, and evacuate them to advanced medical care.

Open Abdominal Wounds

An open abdominal wound is a wound to the abdomen that cause the exposure or herniation of internal organs. Such wounds are also called an open abdominal wound with protruding viscera. Large lacerations or incisions may damage the abdominal wall exposing or allowing the herniation or organs, often the intestines. Open abdominal wounds may be caused by knife violence.

Treatment. Treatment is to first control the bleeding. Do not remove objects protruding from the wound or organs. Do not remove clothing that is stuck to the organs. Cut the rest of the clothing away leaving the clothing in contact with the organ in place. Use plain or hemostatic gauze to stop the bleeding following the guidelines in Chapter 12 (“Wound Management”).

Once bleeding is controlled, do not attempt to put the organs back into the body. If you must handle the organs, do so very gently. Cover the organs with gauze moistened with saline or water.

To reduce tension on the abdomen, place the patient’s feet towards their pelvis so their knees are elevated (Figure 20.5). Treat for shock. Evacuate the patient to advanced medical care.

Gunshot Wounds

Gunshot wounds (GSWs) are traumatic injuries caused by projectiles (bullets, shot) shot from firearms. The nature and severity of gunshot wounds depend on many factors such as the type of munition, the target’s distance, and what body part is hit. As with many injuries, luck is a

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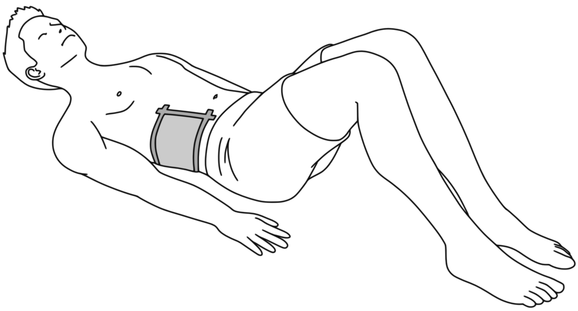
[xi] In 2016, a klansman stabbed three antifascist counter-protesters during a KKK rally in in Anaheim, California.[133] Later that year, neo-nazis stabbed six antifascists who were counter-protesting the neo-nazi Traditionalist Worker Party (TWP) in Sacramento, California.[134] In 2019 in Portland, Oregon, during a protest against Microsoft’s collaboration with ICE, a nazi pulled a knife on protesters.[135]

Figure 20.5: Open Abdominal Wound[12]



factor, but this is magnified with gunshot wounds as a change of trajectory of few millimeters can be the difference between a bullet passing cleanly through muscle with minor damage and a bullet hitting bone causing catastrophic damage.

Ballistics

Guns operate by igniting a propellant that rapidly expands forcing the projectile down the barrel. Longer barrels allow projectiles to accelerate for more time thus giving them a higher muzzle velocity. The amount of damage done to tissue by a projectile, and thus its capacity to wound and kill, is directly proportional to its kinetic energy (KE) at impact.[136] The KE k of an object of mass m moving at velocity v is represented by the following equation.

$$k = \frac{1}{2}mv^2$$

For example, consider a 5.56×45 mm NATO round fired from an M4. It has a mass of 3.56 g and a muzzle velocity of 993 m/s giving it 1755 J of KE. Compare this to a 9×19 mm round fired from a Glock handgun. It has a mass of 7.45 g and a muzzle velocity of 360 m/s giving it 481 J of KE. Despite the latter bullet having more than twice the mass, the rifle round has over three and a half times more KE due to its higher velocity, and thus is considerably more deadly.

Not all projectiles fired are bullets. Shotguns fire a large amount of small balls or pellets called shot. A single shotgun shell typically contains shot of the same size, though different shells use different sizes for different purposes (for example, buck shot vs. bird shot). Though the velocity of shot is lower than that other firearms, the higher number of projectiles fired from shotguns gives them double the mortality rate of other weapons.[136]

Projectiles lose their velocity as they travel, with shot losing its velocity faster than bullets. This leads to lower KE at impact and less tissue damage at greater distances.

A component of tissue damage and lethality is "stopping power," or the ability to instantaneously incapacitate a target. Kinetic energy as well as velocity on its own are factors in tissue damage from projectiles, though other factors may be more important.[xii] For example, projectiles that expand after impact will deposit more kinetic energy into the target, and projectiles that fail to exit the body will likewise deposit more energy into tissue.[136,137] Dense tissue, and in particular bone, absorbs more kinetic energy and thus leads to greater damage. Thus, larger rounds, hollow point bullets, and bullets striking bone or failing to exit the body are more likely to lead to grave injury.

Treatment

Treatment principles for gunshot wounds are similar to other wounds in that the treatment begins by controlling bleeding. Use of hemostatic gauze of chest seals may help prevent exsanguination. Consider use of a tourniquet for gunshot wounds to extremities. Ensure that you search for and control the bleeding of exit wounds if they exist. Search for multiple GSWs by examining the patient's entire body as some may be non-obvious but more severe than the first you find.[xiii] Do not attempt to remove bullets or bullet fragments. If possible or time allows, splint limbs with fractures before transporting the patient. Treat the patient for shock, and evacuate them to advanced medical care.

[xii] There is debate about what leads to tissue damage and mortality, and to a large extent this is not important for medics. This is an entire field known as "terminal ballistics" and is out of scope for this book. Because medics can only render first aid, all that must be known is that getting shot is bad.[citation needed] Advanced topics are of greater relevance for emergency physicians. A good starting point for further reading is the paper *Clinical Update: Gunshot Wound Ballistics* by Craig S. Bartlett.

[xiii] In August 2020, during the unrest in Kenosha, Wisconsin, following the shooting of Jacob Blake by the police,[138] a fascist murdered two protesters and shot a third. The first victim, Joseph Rosenbaum, was shot in the groin, back, and hand, and had a graze on his head that was visible through the t-shirt he had used as facial concealment.[139] Video showed protesters (non-medics) rush to help him. In the confusion, one protester says "Where's the hole?" while another identifies the graze wound on his head. Several people put pressure on his head, then the video ends. Two grievous injuries were missed because one minor injury was the first to be identified. Remember to look for all injuries and treat the most serious first.

Blast Injuries

Blast injuries are injuries caused by explosions. Outside of combat, these are generally seen as a result of terrorist[xiv] attacks. Less-lethal weapons generally do not cause significant blast injuries outside of damaged extremities. They may also be caused by high-voltage electrical shocks.

Classification

Blast injuries are classified according to the mechanism of injury.

Table 20.2: Blast Injuries

Type	**Cause**
Primary	Blast wave overpressure on tissue
Secondary	Flying objects or shrapnel
Tertiary	Victim thrown by pressure wave
Quaternary	All others (e.g., flash burns, crush injuries)

Primary. Primary blast injuries are trauma to tissues from the blast wave overpressure.[xv] These injuries primarily affect air-filled tissues such as the lungs and ears. The most common fatal injury due to a primary blast injury is pulmonary barotrauma.[80]

Secondary. Secondary blast injuries are trauma caused by flying objects. This includes loose objects near the explosion, casing of the explosive device itself, and shrapnel such as ball bearings packed around the explosive to maximize casualties. Secondary blast injuries include penetrating and non-penetrating injuries. An example of penetrating trauma is metal scraps becoming embedding in the patient's body. An example of non-penetrating trauma is a loose brick striking the patient's chest causing internal injuries.

Tertiary. Tertiary blast injuries are injuries caused by a pressure wave or blast wind knocking down or throwing patients through the air. The pressure wave is the initial pressure wave expanding outwards from the source of the explosion. Blast wind is both the forced super-heated air flow expanding outwards[141] and the movement of air back towards the source of the explosion caused by negative pressure.

[xiv] The term "terrorist" is loaded, political, and principally defined by the kinds of shite governments who put cycling advocacy groups on terrorist watch lists.[140] For now, the term suffices and means "irregular militant who attacks non-combatants."

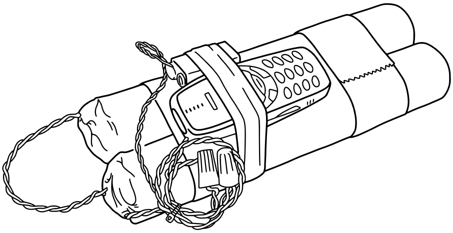
[xv] Mechanisms of damage include spalling, shearing (inertia), and implosion.[80] If you are curious, you can read about these on your own, but they are out of scope for this book.

Quaternary. Tertiary blast injuries are injuries caused by all other means. This may include inhalation of smoke or toxic substances, internal bleeding or crush injuries caused by structure collapse, or burns such as flash burns or burns sustained due to fires.

Factors Affecting Injuries

Several factors determine the severity of injuries to patients as well as mortality rates.

Figure 20.6: Pipe Bomb[12]



Proximity to explosion. The intensity of the overpressure wave decreases cubically with distance. Victims 3 m from an explosion are exposed to eight times the amount of overpressure as victims 6 m from an explosion.[80]

Environment. Enclosed spaces and solid surfaces can reflect blast waves leading to waves of longer durations and increased energy transfer into the body.[142] Victims in enclosed spaces such as building or buses and victims near solid walls will have more severe injuries and higher mortality rates.[80]

Quantity and type of explosive. The quantity of explosive will lead to a larger explosion. High-order explosives (with instantaneous detonation) will lead to greater injuries than low-order explosives. High-order explosives have an overpressure wave, and low-order explosives do not.[141]

Presence of shrapnel. Improvised explosive devices (IEDs) may have shrapnel such as nails or ball bearings added to increase casualties. This shrapnel may create gunshot-like wounds.

Treatment

Treatment of blast injuries is not a simple task, even for well-equipped emergency physicians.

> Blast injuries commonly occur not as isolated incidents, but as part of multiple-casualty incidents of varying sizes. This pattern, combined with the fact that most emergency physicians have never encountered a blast injury victims or a true mass casualty incident, makes the care of often eminently salvageable victims contingent upon appropriate training and skill retention by the individual emergency physician...[80]

Medics who encounter victims of blast injuries will have to rapidly triage patients following the guidelines discussed in Chapter 6 ("Patient Assessment"). Treatment principles will follow depending on the exact nature of the injuries found.

Pulmonary barotrauma is common and often manifests with hypoxia.[80] If possible, patients should monitor the patient's peripheral blood oxygen saturation with a pulse oximeter. Medics should treat patients as if they have acute respiratory distress. While there is little medics can do on their own, they can determine whose condition is deteriorating and relay this to advanced medical personnel. Treatment for the various injuries see in blast injuries can be found in their respective chapters.

Other injuries include: pneumothoraces, concussions, shock, tympanic membrane perforations, fractures, amputations, internal bleeding, wounds, and burns. Patients may develop delayed symptoms such as if they have pulmonary gas embolism or damage to to their gastrointestinal tract. Medics cannot neither diagnose nor rule out such injuries. All patients should be sent to advanced medical care for additional screening.

Summary

Most combat injuries do not necessarily require special treatment as they are merely combinations of other injuries. Treatment principles generally involve treatment of wounds, treatment of burns, and treatment of shock. Eye and ear injuries may be common depending on brutality and malice with which police use less-lethal weapons.

21 : Cold Injuries

> In the dark of the moon, in flying snow, in the dead of winter, / war spreading, families dying, the world in danger, / I walk the rocky hillside, sowing clover.
>
> Wendell Berry, *February 2, 1968*[143]

Humans evolved from the apes of Africa, and as a result we are well adapted for warm climates.[144] Our generally flat and angular bodies and our long limbs evolved to promote heat loss.[i] We are relatively hairless and are able to sweat to cool ourselves when we overheat. However, we are evolutionarily ill equipped to handle cold weather, and without proper clothing or sources of heat, our bodies begin to malfunction, eventually leading to death.

Cold injuries are caused by a cold environment or contact with cold objects. This may be as mild as minor hypothermia or as severe as limb loss due to frostbite. Medics may see cold injuries during long marches in cold weather, during prolonged occupations, or as a result of cooling following police use of water cannons.

A difficulty in treating cold injuries is that patients may assume they can "tough it out" and that their illnesses can be overcome by sheer force of will. Treatment of cold injuries requires getting somewhere warm and removing wet clothing which typically requires leaving an action. Better than treatment is prevention and early interventions to prolong the length of time protesters are willing to stay at an action.

Physiology

Humans, like all other mammals, are warm-blooded, or more scientifically, we are endotherms. We maintain a relatively constant body temperature through the production of heat via a higher metabolic rate at the expense of energy conservation.

Our body's ability to control its temperature is called thermoregulation. The hypothalamus, a structure in the forebrain, releases hormones that stimulate heat retaining or heat losing responses in the body.

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[i] Respectively these are Bergmann's Rule and Allen's Rule.[145]

Normal human body temperature (normothermia) is defined as a core temperature of 36.5 to 37.5 °C. A person's body temperature fluctuates throughout the day following their circadian rhythms. The peak and average temperatures from day to day for a given person will vary as well, and not all humans have the same average temperature.

Heat is lost in proportion to the total body surface area and heat is generated in proportion to mass. Surface area increases quadratically with size, and volume (which approximately predicts mass) increases cubically.[ii] Thus, leaner individuals will cool more rapidly than fatter or more muscular individuals. Additionally, fat is an insulator, so leaner individuals will lose heat more rapidly than others of the same surface area.

The human body operates via many, many complex chemical reactions. These chemical reactions require input energy, even the reactions that produce usable energy. The amount of energy needed for a chemical reaction to take place can be decreased by the presence of a catalyst. A catalyst is a substance that lowers the reaction energy needed for a chemical reaction to take place without the substance itself being consumed by the reaction. Enzymes are proteins (and sometimes RNA molecules) that act as catalysts in biochemical reactions. Proteins' ability to function depend on their shape which in part depends on their temperature. Outside its optimal temperature range, an enzyme loses its shape and can no longer catalyze chemical reactions. If the body gets too warm or too cold, it can no longer effectively carry out the chemical reactions required for life.

Thermoregulation

The human body has mechanisms for regulating its temperature. It can both actively warm and passively cool itself. Both of these work because of the second law of thermodynamics, which implies (loosely) that heat will move from hotter objects to colder objects until uniform heat has been reached. A greater difference in heat between two objects will lead to faster heat transfer.[iii]

Heat Production

Body heat is primarily produced by metabolism. Metabolism is the set of all the life-sustaining chemical reactions in the body. Metabolic reactions require food as an input source of stored energy. These reactions are not efficient, and as a result much of this energy is lost in the form of heat. This heat warms the body and is lost to the environment.

[ii] This can be seen when looking at a sphere. Volume is given by $V = \frac{4}{3}\pi r^3$. Surface area is given by $A = 4\pi r^2$.

[iii] Those who studied physics will remember the heat equation: $\dot{u} = \alpha\nabla^2$

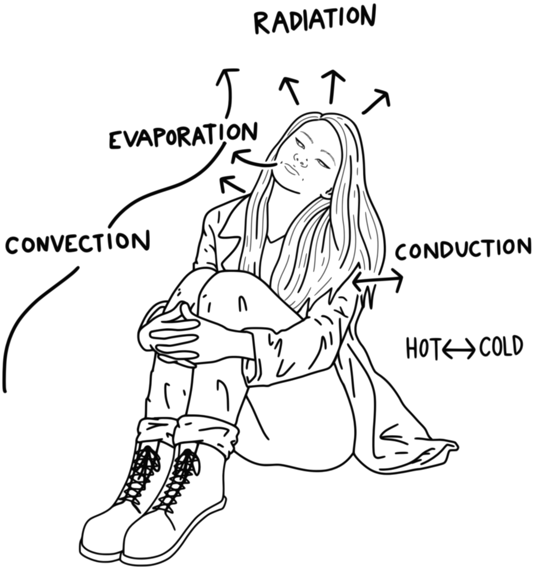
During exercise, stored chemical energy is converted to mechanical energy and heat is produced, and roughly 75% of of the heat produced comes from the muscles. As exertion increases, so does the amount of energy used, and thus more heat is produced.

The excess heat produced by muscle contractions is why shivering keeps the body warm. Intense shivering can generate 5 to 6 times the amount of heat as the resting metabolic rate and up to 50% of the maximum metabolic rate.[25]

Heat Loss

Heat is lost to the environment by a number of mechanisms: conduction, convection, radiation, and evaporation.

Figure 21.1: Heat Loss[12]



Conduction. Conduction is the transfer of heat from one object to another through direct contact. The rate of heat transfer is proportional to both the difference in temperature of the two objects as well as the surface area of contact.

Sitting on a cold bench will conduct heat and cool your back. Standing on cold ground in shoes with thin soles will cool your feet. Insulation slows the effects of conduction. Sitting on a thick blanket or wearing thick shoes slows the direct transfer of heat.

Convection. Convection is the transfer of heat due to the movement of molecules in a fluid (a gas or a liquid). The rate of heat transfer is proportional to both the difference in temperature of the objects and the air as well as the surface area that is exposed.

When cold air moves across your skin, some heat is lost to the moving air. Cold, moving water rapidly strips heat from the body. Remaining still in cold air or water creates a microclimate around our body. Moving air or water strips away this microclimate. This is why you feel colder on a windy day compared to a still day even when the temperatures are the same. This effect is called wind chill (Table 21.1). Clothing that is windproof preserves this microclimate and keeps the body warm.

Table 21.1: Windchill Temperature (Air Temperature vs. Wind Speed)

Wind Speed	**Temperature (°C)**					
0 km/h	0	-5	-10	-15	-20	-30
5 km/h	-1.6	-7.3	-12.9	-18.6	-24.3	-35.6
10 km/h	-3.3	-9.3	-15.3	-21.2	-27.2	-39.2
15 km/h	-4.4	-10.6	-16.7	-22.9	-29.1	-41.4
20 km/h	-5.2	-11.6	-17.9	-24.2	-30.5	-43.1
30 km/h	-6.5	-13.0	-19.5	-26.0	-22.6	-45.6
40 km/h	-7.4	-14.1	-20.8	-27.4	-34.1	-47.5

Values calculated using:

$$T_{\mathrm{WC}} = 13.12 + 0.6215 \cdot T_{\mathrm{a}} + (0.3965 \cdot T_{\mathrm{a}} - 11.37) \cdot v^{0.16}$$

Radiation. Radiation is the transfer of heat in the form of waves or particles. The skin produces infrared radiation that is lost into the environment. Our surroundings also radiate heat in the same fashion. On cloudy days, this radiated heat is reflected back towards the surface of the Earth. On clear days, more of this radiation is lost to space. This is why clear nights tend to be colder than cloudy nights.

Evaporation. Evaporation is the conversion of a liquid into a gas. Evaporation is an endothermic (heat-absorbing) process where higher energy molecules (those with more heat) escape into the surrounding gas. Evaporation of water occurs faster in dryer air. When we sweat, energy is transferred from our skin to the water molecules as they evaporate into the surrounding air. When we breath, air is warmed and moistened by our airway before it reaches the lungs. This moisture and heat are lost to the environment when we exhale.

Temperature Measurement

The human body is not uniform in temperature at every point. The temperature of the skin in extremities is cooler than the skin of torso, especially in cold weather. However, the danger to life comes from the temperature of the internal organs falling outside of the normal range. The important measurement is core temperature (as opposed to peripheral temperature). Measuring the true core temperature requires more complex or invasive methods, but this value can be accurately estimated using other methods.

Tympanic temperature. Tympanic temperature which measures the temperature of the tympanic membrane (ear drum). The tympanic membrane shares a blood supply with the brain and gives a good estimation of the intracranial temperature. Medics may do this incorrectly, so it is not recommended.

Forehead temperature. Forehead thermometers is measure the temperature of the temporal artery using an infrared sensor. Despite its accuracy, the infrared thermometer used for forehead temperature measurement looks like a gun, so it is not recommended for use by medics.

Oral temperature. Oral temperature is typically 0.3 °C to 0.6 °C lower and less accurate than a tympanic or forehead measurement. Consuming warm food or drink and smoking increase the measured temperature. Consuming cool food or drink and mouth breathing decrease the measured temperature. That said, this is an acceptable method for medics to measure a patient's temperature.

Axillary temperature. Axillary temperature is typically 0.3 °C to 0.6 °C lower and less accurate than a tympanic or forehead measurement. This it is the recommended method for measuring a patient's temperature. To measure axillary temperature, use a digital thermometer. Place the thermometer under the patient's armpit directly against the skin. Wait for the beep that signals that the temperature has been measured. Read the value from the display.

In order to accurately read temperatures below 35.5 °C using any of these methods, you may need a special thermometer. Check that your thermometer is rated for hypothermic temperatures before attempting to use one to measure a hypothermic patient's temperature or you may get an inaccurate reading. Note that these tend to be designed for rectal use, and thus are appropriate for measuring oral and axillary temperature. Additionally note that getting a temperature reading is not necessary to diagnose and treat hypothermia.

Preventing Cold Injuries

Treating cold injuries is difficult without removing the patient to a warm environment, so the best treatment is prevention. Keeping a patient warm and dry is easier than warming or drying a patient, and early interventions are easier than trying to aggressively warm a hypothermic patient.

Umbrellas, ponchos, and waterproof clothing will keep patients dry in the rain or when police use water cannons. Thick, windproof clothing will prevent heat loss on windy days. Gloves and shoes with insulating socks will help prevent frostbite on hands and feet. During rainy, multi-day actions, multiple pairs of dry socks are indispensable for protecting the feet from cold injury.

FOOD
NOT
BOMBS
RENT IS THEFT
FREE SOUP FOR
THE REVOLUTION

Aid stations with hot drinks to hand out will do wonders to help cold patients during actions. Pop-up tents with four walls and blankets can be used to treat the most hypothermic patients. This is generally more work than a medic collective can handle themselves, but since it doesn't require medical expertise, this work can be shared with community members. Organizations like Food Not Bombs likely already exist in your region, and medics should coordinate with them before actions in cold weather. The consumption of alcohol should be avoided as it increases susceptibility to hypothermia.

Tea, Soup, and Blankets - Anonymous

In December of 2017, the German far-right political party Alternative für Deutschland (AfD) was having a national convention in Hannover. Our goal was to disrupt the event by blockading the streets to prevent the delegates from making it to the event. It was scheduled to start at 10 in the morning, so to beat the police, we left where we were staying at 05:00 to be at our rally points at 05:30.

After clashing with cops and getting kettled, the groups at the different intersections sat down to form sit-blockades. Eventually the police drove water cannons to the blockades and hosed down the protesters in the subfreezing weather.[146] Some people were prepared enough to wear waterproof clothing. Others brought umbrellas and emergency blankets to deflect the water, but most everyone got soaked. After the blockades, there was a march through the city. That meant some people were outside, maybe wet, for 12 hours in weather that only ever reached maybe 2 °C.

Luckily, there was wonderful support from the community. There were stations with hot food and drink as well as people with wagons filled with hundreds of emergency blankets to hand out. Even some of the dry protesters were cold-stressed, but they were able to wrap up and get something warm into them.

The day was a success, and we managed to significantly delay the start of the event. I think if it wasn't for all of the non-medics handing out hot drinks and blankets, we would have seen a lot more ill and miserable protesters.

Hypothermia

Hypothermia is defined as a core temperature below 35 °C.[iv] A small drop in body temperature results in shivering, and as temperature drops further symptoms progress to loss of motor function, mental deterioration, unconsciousness, and death. A difficulty in diagnosing hypothermia is that a patient with low grade hypothermia may be assumed to simply be tired and irritable from miserable cold conditions. However, this is when hypothermia is most easily reversed.

The body's reactions to cold are designed to keep organs warm at the expense of limb function. Vasoconstriction of the arterioles decreases the amount of blood that flows to the skin causing extremities to cool before the torso. This causes a slight increase in blood pressure, and to relieve this, the body produces additional urine (cold-induced diuresis) even before there is a drop in core temperature.[147] Diuresis is exacerbated by alcohol consumption. These changes are important because they contribute to two side effects of rewarming: afterdrop and hypotension. Afterdrop is a continued drop in core temperature after rewarming. This drop in core temperature may be as much as 5–6 °C.[25] Hypotension occurs as the reduced blood volume in the core now must circulate through additional blood vessels in the extremities.

[iv] This chapter does not discuss medically induced (intentional) hypothermia. For brevity, the term "accidental hypothermia" is not used.

Small muscles under the skin attached to hair follicles (arrector pili) contract to pull the hairs upright to allow them to trap more head. This is what causes goosebumps. Sweat production decreases. If the body becomes cold enough, muscles will begin shivering to generate heat.

Alcohol is a central nervous system depressant, and in relation to thermoregulation, alcohol impairs the function of the hypothalamus. This impairment prevents the body from taking adequate measures to prevent heat loss. The onset of shivering is delayed, and it's duration is reduced. Alcohol is also a vasodilator which causes a sense of warmth when blood rushes to the skin. This increases heat loss.

Hypothermia is classified as either primary or secondary. Primary hypothermia is when an otherwise healthy patient is unable to produce sufficient heat in a cold environment. Secondary hypothermia is when illness or injury impairs a patient's ability to produce heat, even in a warm environment. Causes of secondary hypothermia relevant to riot medicine are anorexia nervosa, malnutrition, central nervous system trauma, and hypoglycemia.[148]

The elderly are at increased risk of hypothermia relative to the rest of the adult population. This is due to a lower resting metabolic rate and decreased thermoregulatory responses to cold.[149] Children are also at increased risk of hypothermia due to a higher surface area to mass ratio and their reduced ability to accurately express their discomfort.

Signs and Symptoms

Hypothermia is classified according to the symptoms that present, though these generally correlate with core temperature (Table 21.2).

Cold stressed. A patient is cold stressed when their baseline metabolism cannot produce enough heat in a given environment but their body temperature is still above the threshold for hypothermia. Cold

Table 21.2: Hypothermia Classification[25]

Severity	**Symptoms**	**Est. Core Temp.**
Mild	Mildly impaired consciousness, shivering	35 to 32 °C
Moderate	Noticeably impaired consciousness, not shivering	< 32 to 28 °C
Severe	Unconscious, not shivering, vital signs present	< 28 to 24 °C
Profound	No vital signs	<24 °C

stress is characterized by shivering without impaired consciousness. Cold stress may be a precursor to hypothermia, or the body shivering may generate enough heat to maintain an adequate core temperature.

Mild hypothermia. Mild hypothermia is characterized by shivering, numb skin, and minor impairment of muscular performance in the extremities such as clumsy fingers. The patient may have minor mental deterioration and may make poor decisions or appear to have sluggish thinking. The patient may have slightly increased respiratory rate, heart rate, and blood pressure as a result of peripheral vasoconstriction.

Later symptoms of mild hypothermia are major impairment of muscular performance such as stumbling and an inability to perform basic tasks. Mental deterioration progresses and the patient may be irritable and forgetful.

Moderate hypothermia. Moderate hypothermia is characterized by a cessation of shivering with obvious mental changes such as incoherence, disorientation, and irrational behavior. Respiratory rate, heart rate, and blood pressure are decreased. Patients with a core temperature below 32 °C have an increased risk of of cardiac arrest arising from arrhythmias (in particular, ventricular fibrillation).[148]

Severe and profound hypothermia. Severe hypothermia is characterized by unconsciousness, a lack of shivering, and present vital signs. The risk of cardiac arrest is substantially increased in patients with a core temperature below 28 °C.[148] At approximately 28 °C, the patient's pupils will become dilated and stop reacting to light.[150] Profound hypothermia is characterized by unconsciousness without vital signs.

Treatment

Patients who have mild hypothermia, no trauma, and no underlying medical condition can be rewarmed in the field. All other patients should be evacuated to advanced medical care due to the risk of cardiac arrest or complications from trauma or an underlying condition.

The typical environment for actions is urban and suburban, and typical lengths of actions are under 12 hours. Given these conditions, it is unlikely that a patient will develop anything beyond mild hypothermia. Protesters who have been kettled in cold weather and can neither move nor leave have an elevated risk of hypothermia, especially if they were previously running and have clothes that are wet with sweat.

When treating your patient, consider their diabetic status before giving them sugary food. Sugary foods may help, but the patient knows better than you how to manage their blood glucose level.

Treatment for Cold Stress

A cold-stressed patient can be easily treated with additional warm clothing or an emergency blanket, high caloric or sugary foods, and warm liquid. The associated hypotension from increased urine output can be in part mitigated by replacing fluids. Encourage shivering, and if possible encourage them to walk around if the environment is safe. This will generate additional heat. Preventing a drop in blood glucose by feeding them will allow them to continue shivering.

Treatment for Mild Hypothermia

The classic wilderness medicine approach to treating mild hypothermia is not practical in urban or suburban environments as much of the necessary equipment is not carried by riot medics, and it can take considerable time to rewarm a hypothermic patient. Thus, patients with mild hypothermia should be wrapped in something warm and sent home with a comrade. For overnight actions and occupations, use the following steps.

Set up shelter. The warming process is long, so first set up a shelter. Shelter prevents further loss from wind or rain. A tent or snow cave will create a pocket of heat that will help warm the patient.

Change into dry clothing. Have the patient change into dry clothing ensuring to cover their neck and head with a scarf and a hat.

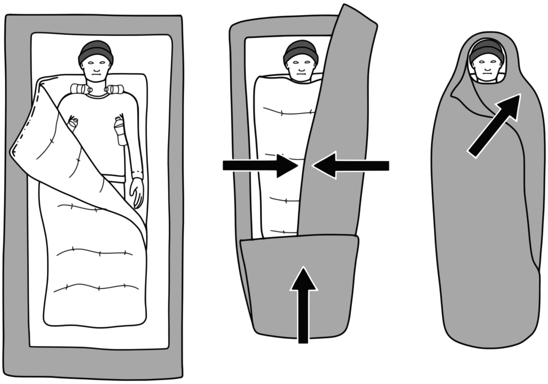
Feed and hydrate. If the patient is able to eat and drink on their own and their diabetic status allows it, give them warm, sugary drinks and food. Heat production from metabolism requires food as fuel. The patient needs to replace fluids lost from increased urination. Reinvigorating a fatigued patient with food and liquid will help prevent them from becoming hypothermic again once they have been rewarmed.

Note that the use of camping stoves in poorly ventilated shelters can lead to carbon monoxide poisoning.[151,152] When warming food or drink, use the stoves outside the shelter.

Warm the patient. Warming the patient is principally done by bundling them up.

Use a hypothermia wrap. Create a hypothermia wrap, or alternatively use a pre-made hypothermia prevention and management kit (HPMK)[v]. To do this, place the patient in a sleeping bag on top of an insulating sleeping mat. Wrap the sleeping bag with an emergency blanket (two may be needed), tucking the edges under the patient to hold it tight.

Figure 21.2: Hypothermia Wrap[12]



Fill water bottles with hot water. Place the hot water bottles inside the sleeping bag against the patient's torso on the chest, abdomen, and axillae. Ensure that hot water bottles are not in direct contact with the patient's skin or thin clothing as cold skin is more susceptible to damage from pressure and heat.[25] You may need to test the bottles against your own skin to ensure you do not burn the patient. Do not use instant hot packs (such as chemical hand warmers) to warm the torso of a patient, as they do not generate enough heat and can cause burns.[25]

Start a campfire. If your shelter is not fully enclosed (such as a lean-to, bivouac, or cave), you can make a fire to help warm the patient. Use an emergency blanket as a reflector to direct more radiant heat back towards the patient. If you cannot make a fire, wrap the hypothermia wrap with a tarp to minimize wind chill.

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[v] A HPMK is not a normal part of a medic or even standard wilderness survival kit. They are large, heavy, expensive, and single-use. They are typically only carried by wilderness rescue services. A HPMK is likely only worth carrying if you are supporting a remote, multi-day action in cold weather, and even then it is likely better to carry preventative supplies then a HPMK.

Avoid warm baths. Efforts to warm the patient should focus on warming their torso using heated blankets and warm water bottles. Patients should not be warmed with a hot shower or bath. This will cause an increase in peripheral blood flow which can cause afterdrop and hypotension which may cause cardiovascular collapse.[25]

Monitor the patient. The patient should remain in the hypothermia wrap for at least 30 minutes and ideally until they feel warm, stop shivering, and have a normal mental status. While they are in the wrap, monitor their LOC and ABCs.

Discourage exercise. Medical guidelines recommend not allowing the patient to stand, walk, or do other exercise for the first 30 minutes of treatment as this can cause afterdrop and hypotension.[25] However, this recommendation is superseded by patient safety and the need for evacuation.

Modify warming for urban actions. If you are at an action and the patient does not want to or is unable to leave, wrap the patient in an emergency blanket and give them warm liquid if they are able to drink on their own. If their clothes are wet, see if there are warm comrades who can trade or donate dry jackets, scarves, hats, or gloves. Consider giving these comrades emergency blankets to prevent them from getting hypothermia too. If the patient is not diabetic, or if they are diabetic and have safe blood glucose levels, give them high caloric or sugary foods and warm drink. The patient should sit or lie down while being warmed, but not directly on the ground as this will cool them. An insulating layer such as a jacket or blanket should be used. Monitor the patient for signs of worsening hypothermia, most importantly a worsening mental status.

Treatment for Moderate Hypothermia

Treatment for moderate hypothermia is much the same as mild hypothermia, but patients need to be evacuated and not field warmed. They may be bundled up during evacuation.

Handle the patient gently. Patients with moderate hypothermia have an increased risk of cardiac arrest. These patients need to be evacuated to advanced medical care. If advanced medical is unavailable or will be significantly delayed, you may need to evacuate the patient or begin treatment yourself. Wet clothing needs to be cut off as opposed to undressing the patient as the movement of undressing may disturb their heart. This should only be done in a safe, warm place.

Evacuate. Warming techniques used in treating mild hypothermia can be used so long as they do not delay evacuation. At a minimum, patients should be wrapped in dry clothing, an emergency blanket, and a tarp during transport.

The patient needs to be kept horizontal during evacuation. See Chapter 7 ("Patient Evacuation") for techniques on how to transport patients. Care should be taken to not jostle the patient while evacuating them. During evacuation, monitor the patient's ABCs and mental status.

If the patient cannot be taken to advanced medical care[vi], medics may attempt to warm them on their own, though this is not recommended.

Treatment for Severe and Profound Hypothermia

Treatment for severe and profound hypothermia is similar to that of patients with moderate hypothermia. Patients need to be evacuated taking care not to cause heart arrhythmias if they still have vitals signs. Patients without vital signs should be rapidly evacuated.

Modify basic life support. Hypothermic patients will not display vital signs in the same way and do not have the same metabolic demands as normothermic patients. A drop in core temperature decreases resting oxygen consumption approximately 6% per 1 °C.[25] At 28 °C, whole body oxygen consumption is approximately 50% of normal and brain oxygen consumption is approximately 35% of normal.[25] At lower temperatures, the brain can tolerate hypoxia for longer. Basic life support is modified to account for this. Note that these modifications are only in cases where the cardiac arrest is caused by hypothermia, not in cases where a patient is in cardiac arrest because of a wound and merely cold feeling.

Check ABCs. Patients who are unresponsive may have difficult to detect vital signs. Check their ABCs for at least 1 minute.

Consider delaying BLS. CPR can be delayed ("scoop and run") to facilitate rapid evacuation should it be unsafe or infeasible to perform CPR.[25] Patients who are in respiratory arrest should, however, be given 10 to 15 minutes of artificial ventilation before evacuation to minimize the chances of cardiac arrest.[98]

Consider not performing BLS. Hypothermic patients may have a stiff chest wall that limits the effectiveness of chest compressions and artificial ventilation, and the chest wall may even be so stiff that chest compressions are impossible.[25] If this is detected, do not continue CPR. Evacuate the patient as fast as possible.

[vi] Advanced medical care is only considered unavailable in this situation if it is truly unreachable or if there is active insurrection that would prevent the patient from being treated.

Perform BLS during evacuation. During evacuation, you may alternate between moving the patient and performing CPR. Perform CPR for at least 5 minutes, then transport the patient for no more than 5 minutes.[153] Repeat this until the patient has a return of spontaneous respiration or has been evacuated.

Do not pronounce the patient as dead. It is important to remember that a patient is not dead until they are warm and dead. Do not stop CPR until relieved by advanced medical personnel or the scene becomes too unsafe to continue. For example, a 2016 study of CPR in hypothermic patients found the longest case of manual CPR was 6 hours and 30 minutes and that the patient made a full recovery.[153]

Frostbite

Frostbite is the freezing of tissue that typically occurs in the fingers, toes, and face. Frostbite causes ice crystals to form in the fluid outside of cells (interstitial fluid). This draws water from the cells, disrupting their normal function. Movement causes these crystals to damage nearby cells. Frostbite causes clots to form in blood vessels leading to a decrease in perfusion (ischemia). This leads to further tissue damage.

There is minimal risk of frostbite when the ambient temperature is above −15 °C (under 5%), but additional monitoring is needed when the windchill temperature is below the ambient temperature is below −20 °C.[80]

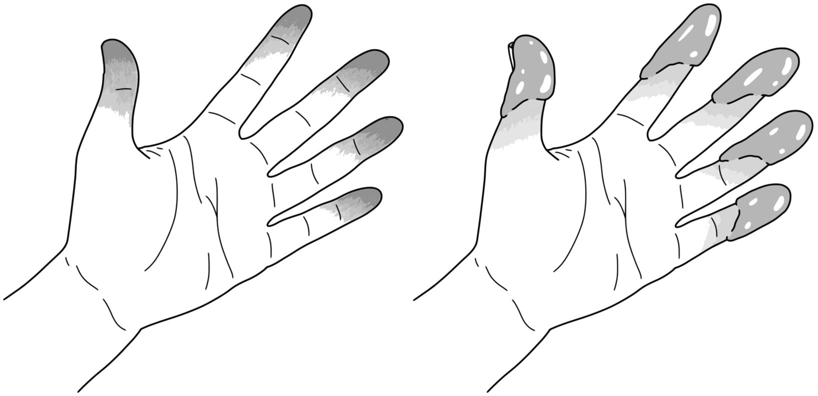
Frostbite can be caused by contact with subfreezing metals and fluids. Touching bare skin to subfreezing metals can cause frostbite in 2 to 3 seconds.[80] Wet skin will become frostbitten faster than dry skin. Contact with subfreezing liquids such as gasoline can cause instant frostbite.

Reduced circulation increases the risk of frostbite. This may be a result of disease such as diabetes or from lifestyle choices such as smoking. Remaining in a constricted position for prolonged periods increases risk for frostbite as it can decrease blood flow to extremities. Wearing jewelry or other constrictive articles like tight boots also increases risk. Dehydration also is a risk factor.

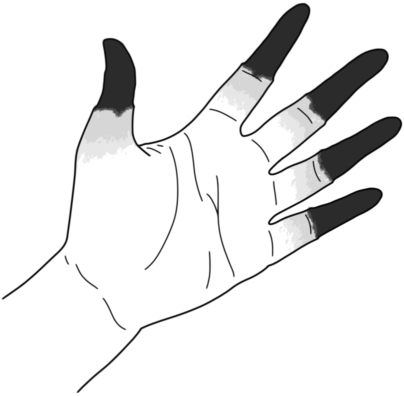
Classification

Frostbite is classified as first through fourth degree based off the apparent depth and amount of tissue damage after rewarming. Rewarming should be done by advanced medical care, though this may not be possible. First and second degree frostbite have generally good prognoses and can be managed by riot medics. Third and fourth degree frostbite require further treatment by advanced medical care.

Figure 21.3: Frostbite Characteristics During Recovery[12]



(a) First Degree (b) Second Degree



(c) Third and Fourth Degree

First degree frostbite. First degree frostbite, also called frostnip, is partial-thickness freezing of the skin. It is characterized by redness with pallor central to the injury. There is mild edema but no blisters. There may be skin peeling several days later. The patient may experience numbness, stinging, or a burning sensation after rewarming.

Second degree frostbite. Second degree frostbite is full-thickness freezing of the skin. The skin is reddish. Significant edema develops 3 to 4 hours after rewarming. Blisters filled with clear fluid form within 6 to 24 hours after rewarming, and after several days they may peel and become hard and black (eschar). The patient may experience numbness, aching, or throbbing after rewarming.

Third degree frostbite. Third degree frostbite is freezing of the skin and upper layers of the subcutaneous tissue. The skin may be blue-grayish in color. Hemorrhagic (blood filled) blisters form, and there is edema. The patient may describe frostbitten extremity as feeling “like a block of wood.” They may experience throbbing, burning, and shooting pains.

Fourth degree frostbite. Fourth degree frostbite is freezing of the skin, subcutaneous tissue, muscle, and bone. The injured area has minimal edema. The skin is mottled and cyanotic, and it does not blanch white when pressure is applied. Eventually, the skin forms mummified eschar. Rewarming may be painless due to nerve damage, or the patient may describe deep, throbbing pain.

Signs and Symptoms

It can be difficult to estimate the depth and severity of frostbite in the field prior to warming. Common characteristics are pale, waxy, and mottled skin. The skin is cold to the touch and if exposed may have frost on it. The patient experiences tingling, numbness, or pain in the body part.

The skin is soft in first degree frostbite. In second degree frostbite, the skin feels hard, but deeper tissues feel soft. The body part feels frozen solid in third and fourth degree frostbite.

Frostbite in the wilderness can be more easily checked for in temporary shelter, but at an action, it is unlikely that a patient will be willing and able to remove their shoes to inspect their toes for frostbite. For this reason, if the temperature is subfreezing, and especially if they have wet shoes, patients with numb feet should be sent home and treated for frostbite.

Treatment

Treatment for frostbite is to thaw the body part and manage the patient’s pain.

Frostnip in the fingertips can be thawed by having the patient place their hands under their armpits. Having a patient cup their hands in front of their face or use of a scarf to trap warm air can thaw their nose, lips, and cheeks. Ideally, patients who have developed frostnip should be sent home to prevent further damage.

It should be reemphasized that treatment for frostbite should be done by medical professionals. They will have stronger painkillers for the painful thawing process and medication that can help with perfusion. They can ensure dead tissue is correctly removed and infection is managed. Use of imaging technology available in a hospital helps guide treatment. Together, this may help minimize the amount of tissue that needs to be amputated.

Protect the frozen body part. Patients should avoid using the frostbitten body part during evacuation, if possible. This means not walking on frostbitten feet or not using frostbitten hands to assist with their evacuation. If possible and practical, wrap fingers and toes with gauze to keep them separated, though not at the expense of being unable to don shoes or gloves.

Prevent additional swelling. If advanced medical care is not reachable or requires prolonged evacuation, field administration of nonsteroidal anti-inflammatory drugs (NSAIDs) is suggested for increasing tissue survival.[154] If you carry ibuprofen and the patient is not allergic, consider administering a maximum of 2400 mg per day (4 doses of 600 mg max). Follow the guidelines for administering medicine from Chapter 9 ("Medication").

Field thaw the frozen body part. The main treatment for frostbite is to rapidly thaw and rewarm the affected body part, however this should only be attempted if there is no risk of refreezing. Thawing and then refreezing a frostbitten body part causes additional, significant damage.[154,155] If the patient cannot be evacuated to definitive care, it is safer to leave the body part frozen.[154] However, if the body part begins to thaw spontaneously during evacuation, this should not be prevented.

Patients with frostbite should also be monitored for hypothermia. Treatment of hypothermia should take precedence over keeping a frostbitten body part frozen. Frostbite may lead to amputation, but hypothermia is more immediately deadly.

If you have a way to heat water and a shelter, consider rapidly thawing the body part in the field if the following criteria are met:

1. Evacuation to definitive care will take over 2 hours.[154]
2. There is no risk of the body part refreezing
3. Thawing the body part will not prevent transport such as hiking down a mountain,

A risk of field thawing is that because of the subsequent edema, the patient may not be able to don their shoes again. Additionally, a lack of strong analgesics may make this an exceptionally painful process.

There are methods of thawing that fall into the category of urban legend, and these are dangerous and unacceptable. Rubbing the frozen body part with snow does not help thaw frostbite. Rubbing a body part with your hands or fabric to warm it can damage tissue. Use of dry heat such as heating lamps, hot rocks, and open flame can cause thermal burns.

Thaw using warm water. To thaw an extremity, fill a tub with water heated to 37 to 39 °C. If you do not have a thermometer, test the water yourself. You should be able to submerge your hand for 30 seconds without discomfort.

Place the body part in the water and circulate water around it. The body part should float freely in the water without contacting the sides or bottom. You may need to frequently rewarm the water, so additional hot water should be prepared. Remove the frostbitten body part from the tub before adding additional water to avoid causing thermal burns. Continue rewarming the body part until the skin is red and purple in appearance and the skin is soft to the touch. This typically takes 30 minutes, but may be longer depending on the depth of the frostbite.

If the body part cannot be submerged in a tank, such as in cases of frostbite on the face, use compresses soaked in warm water placed on the skin. Like with submersion, the water should be 37 to 39 °C. These compresses should be frequently changed to keep them warm.

Dry the body part. Do not rub the body part dry after it has thawed. This may cause additional damage. Allow the body part to air dry, or gently pat it dry using a towel or gauze.

Prevent dehydration. If the patient is alert and able to drink on their own, they should drink warm liquids to prevent dehydration.

Treat blisters. Do not pop blisters in the field unless doing so is necessary for evacuation. During definitive care, blisters filled with white or clear fluid should be popped and the dead tissue removed.[155] Do not pop hemorrhagic blisters as this causes dessication of the underlying tissue. For all blisters, apply topical aloe vera and cover the blisters. Reapply aloe vera and change the dressings every 6 hours.

Provide extended care. Loosely wrap the wound with gauze to leave room for significant swelling from edema to avoid causing pressure or restricting blood flow. Elevate the body part above the heart to minimize edema. If they are not allergic, the patient should take 400 mg of ibuprofen every 12 hours until the swelling subsides.[155] The thawed body part needs to be monitored for signs of infection and compartment syndrome.

Non-Freezing Cold Injuries

Non-freezing cold injuries are injuries that result from continuous exposure to cold, wet conditions that do not result in the freezing of tissue.

Trench Foot

Trench foot, also known as cold water immersion foot, is a medical condition caused by prolonged exposure of the feet to cold, wet conditions[vii]. The name trench foot is a reference to the trench warfare of WWI where it was a common cause of injury. Long periods of vasoconstriction caused by the cold deprive tissues of oxygen and nutrients.[98] The severity of the injury is determined by both the length and degree of cold exposure.[156] The effects of the injury may be pain, tenderness, and tingling for several days to a few weeks, but more serious cases can cause permanent tissue damage.

Signs and symptoms of trench foot are numbness and tingling. The skin is wrinkly or pruney and is cool to the touch. There may be swelling. There may be altered skin color, either pallor, erythema, or cyanosis. The skin may have poor capillary refill time. Pain is not common in the field and typically occurs during rewarming. In later stages there may be a foul odor due to necrosis caused by fungal or bacterial infection.

Chilblains and Pernio

Chilblains, sometimes called pernio, are redness, itching, and inflammation in the hands or feet caused by damaged to capillary beds. There may be burning, itching, or painful sensations in the affected extremities. Blisters may develop. Long-term chilblains may develop dark crust on the blisters. Chilblains are often confused with frostbite and trench foot.

Treatment for Non-Freezing Cold Injuries

Warm the affected extremity at room temperature (15 to 25 °C). Elevate the extremity to reduce swelling. Consider administering NSAIDs to help reduce swelling and help with the pain of rewarming.

[vii] Trench foot is one type of immersion foot, the others being warm water and tropical immersion foot. Symptoms and treatment[157] are similar enough to trench foot to not be covered on their own.

Prevention of Non-Freezing Cold Injuries

Non-freezing cold injuries can be prevented by saying warm and dry as well as ensuring good circulation. Eating, staying hydrated, and not wearing constrictive clothing helps ensure good circulation. Having a warm core prevents peripheral vasoconstriction.

Extremities should be kept warm and dry. Appropriate clothing such as waterproof boots, moisture wicking socks, and gaiters will help keep the feet dry.

Socks should be changed every 6 to 8 hours, and wet socks should be dried against the torso. Feet should be allowed to dry for several hours per day, and feet should be kept warm and dry during the night. Rest while symptoms persist helps prevent trauma to the body part until they have healed. This advice applies generally, but is especially important during extended actions either in the wilderness or during prolonged occupations.

Urban Legends

One urban legend that comes up frequently in medic guides as a treatment or prophylaxis against cold injury is fire cider. Fire cider is a type of drink (often marketed as a tincture) with alleged health benefits. In its most simple form, the ingredients are apple cider vinegar, cayenne pepper (Capsicum annuum), and honey. While the drink itself may have some health benefits such as having nutrients or being tasty to consume while sick, it does not provide any benefit for acute injuries or illnesses. Unless the drink is warm, giving it to a hypothermic patient will force them to expend energy to warm the cold liquid to their current body temperate. This does not help them recover. The “warming” feeling the patient may feel after consuming it lukewarm or even cold is due to the capsaicin activating the capsaicin receptor (TrpV1) in the stomach. Additionally, the patient may have allergies to fire cider ingredients, or improper preparation or storage of the mixture may cultivate harmful bacteria or their toxins.

Summary

A patient may become hypothermic because of the cold (primary hypothermia) or because of an underlying medical condition even in warm weather (secondary hypothermia). Severity is measured by mental status and the presence of shivering. Patients who are functioning normally and shivering are cold stressed and need dry clothes, warm food, and light exercise. Patients who have degraded mental functions and are shivering have mild hypothermia and need to be warmed in a hypothermia wrap. Patients who have degraded mental functions and have ceased shivering need to be evacuated to advanced medical care while taking care not to jostle the patient as this may cause arrhythmias. Basic life support is modified because of the body's reduced oxygen consumption, and it may not need to be started immediately ("scoop and run").

Very minor frostbite can be treated by warming a frozen extremity against the body or by trapping warm again in front of the face with a scarf. All other requires thawing which is unlikely to be doable during an action and is best done by advanced medical care.

Generally, protection against cold injuries comes from dressing appropriately, staying warm, and staying dry to the largest extent possible. At the onset of cold injury, patients should be evacuated and treated as field treatment is significantly more difficult than in a controlled setting, and may not be possible at all during an action.

22 : Heat Illness

> Global heating will severely challenge civilisation in some areas and probably vanquish it in others.
>
> Anonymous, *Desert*[158,i]

Heat illness is a range of illnesses caused by exposure to hot environments. These may be quite minor in nature (nothing more than a nuisance), or they may be fatal if not rapidly treated. Proper clothing and hydration are significant mitigations, but the Black Bloc doesn't rest during the summer. Weather that may be only unpleasantly warm for well prepared protesters may be dangerous for black clad anarchists running through the streets.

A direct result of anthropogenic climate change is that there will be hotter, more humid weather globally.[159] Historically, heat waves have lead to spikes in heat related deaths, and these deaths disproportionately affect the poor, elderly, and minorities,[160,161] not to mention the houseless.[162] Ignoring other causes like fires and asthma, climate change will lead to increasing deaths as a result of extreme heat.[163]

Though many of these deaths during heat waves do not occur in settings where medics are present, an increasing number of hot and humid days means that more actions where take in weather that can heat stress demonstrators. This may be especially true during remote actions and occupations where participants cannot easily escape to a climate controlled building.

The sections on physiology and thermoregulation in Chapter 21 ("Cold Injuries") are considered prerequisites for this chapter.

Physiology

The hypothalamus controls thermoregulation by inducing cooling or heating mechanisms to get our core temperature to reach a given set-point. Typically this hypothalamic set-point is 36.5 to 37.5 °C (normothermia). When we get sick, the set-point is elevated to help us fight pathogens.

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[i] For a look a what the future holds for both the environment and anarchism, read *Desert*.

This difference in temperature between our current core temperature and our set-point is why we shiver when we have fevers. Hyperthermia is a core temperate of 37.5 °C or higher caused by external heating.

A fever, also known as pyrexia, is distinct from hyperthermia. A fever is the body intentionally increasing core temperature, whereas hyperthermia is an increased temperature due to an inability to cool. That said, fevers over 40 °C are classified as hyperpyrexia and are a medical emergency.

The human body loses water through both sensible and insensible ways. Sensible water loss includes urination, sweating, vomiting, and diarrhea. Water loss from sweat during exercise in hot weather can have a sustained rate of 500 mL with peak rates of 1200 mL per hour. Insensible water loss which primarily occurs through the respiratory tract and skin. The skin is a poor water barrier.[164] In normal conditions, the body loses approximately 400 mL per day through the skin, and in hot and dry conditions, this loss can be over 1000 mL.[164] Normal water loss from the respiratory tract is 200 mL per day, but while marching in dry conditions, this can be as high as 450 mL per day.[164]

The body can be acclimatized to heat allowing for more exercise at higher temperatures without suffering heat injury. Acclimatization leads to sweating at lower temperatures, dramatically increased sweat production (up to 3 L/h), and longer sustained periods of sweating.[80] The heart rate is lower for a given temperature, and there is a general increased tolerance for exercising in heat.[80] Generally, acclimatization can be achieved in 10 to 14 days with 1 to 2 hours of exercise in heat, and this adaptation persists for approximately 1 month.[165]

Elderly individuals have dulled ability to sense heat and thirst. Their thermoregulation responses to heat (sweating and vasodilation) begin at higher temperatures, and they sweat less. For these reasons, they are at higher risk for heat illness than younger individuals. Similarly, children sweat less than adults and may be unable to communicate their illness to their caretakers. It may be assumed that they are just tired, irritable, or grouchy when in reality they have minor heat illness or dehydration.

Tonicity

The tonicity of a solution is a measurement of the potential of a solution to cause the flow of water across a semipermeable membrane. Tonicity is determined by the amount of solute dissolved in a solution. In human biology, the tonicity of a solution is whether or not it cause water to move in or out of cells. For example, isotonic saline is 0.90% NaCl weight by volume (w/v). Solutions that have a higher concentration of solute of hypertonic. Solutions that have a lower concentration of solute are hypotonic.

Thermoregulation

If the ambient temperature is above the temperature of our skin, we gain heat from the surrounding atmosphere. We also gain radiated heat from the sun and other warm objects such as buildings or asphalt.

Evaporation is the primary means by which we cool ourselves. As sweat evaporates, heat is lost into the environment. The rate at which evaporation happens depends on the relative humidity of the surrounding atmosphere. At a relative humidity of 100%, no evaporation occurs. When the weather is hot, we feel hotter on more humid days, and when the weather is cold we feel colder on drier days.

The wet-bulb globe temperature (WBGT) attempts to combine the effects of temperature, humidity, wind, and radiated heat to give a single, modified temperature reading. This is done by but placing a dark bulb thermometer in the sun and a thermometer with a wet cloth over it in the shade and allowing wind to pass over it.[166] The temperature calculated by this method is a “worst case” as it assumes a person is wearing dark clothing and isn’t being cooled by additional fanning. Even the most fit and healthy humans cannot survive a WBGT of 35 °C for any sustained amount of time.[167]

Children, the elderly, the ill, and fatter people will be impacted at lower WBGT. Exercising in the heat increases the risk of heat injury as the body is additionally heated internal by its metabolic processes. People who have not been acclimatized to heat will are at greater risk of heat injury especially while exercising.

Prevention

Prevention of heat injuries require preparation and education. Much of this work needs to be done before an action.

Coordinate with the community. These prevention efforts require coordination with the community in which you exist. Work with the organizers of an action to help spread tips on how to prevent heat illness in the days leading up to an action. Zines and educational images posted to social media can be very helpful. If the predicted temperature and humidity are expected to be high, the organizer may need to issue a warning to high risk groups or even cancel the event all together. Actions in hot weather should have aid stations with shade and water. This is more important for larger actions that draw more elderly participants. During radical actions, such aid stations are unlikely to be useful or even possible.

Dress appropriately. Clothing should be loose fitting, light in color, and breathable to allow sweat to evaporate. Hats, especially those with large brims, can keep direct sunlight off the head, face, and neck.

Dressing appropriately in hot weather has to be weighed against the need for safety and anonymity. Individuals may wear pants, long sleeve shirts, hats, or balaclavas to obscure their identity. Members of the Black Bloc may be totally totally covered in dark clothing making them more susceptible to heat illness than other participants. However, this is countered by the general youth and vitality of Black Bloc members, the increased risk cause by the their clothing may be somewhat negated.

Bring an umbrella. An umbrella can provide portable shade during an action. They are also useful for obscuring parts of the crowd from video surveillance.[ii]

Bring water. Based on the described rates of sensible and insensible water loss, it should be clear that a large amount of water must be consumed during moderate exercise in hot weather. However, and stated anecdotally, individuals may intentionally underhydrate to avoid the need to urinate during actions. This has some practical value as actions may suddenly kick off, and no one wants to run or fight with a full bladder. Additionally, there may be few places to urinate during actions (especially for participants without penises), and public urination may carry significant legal penalties.

It is still worth attempting to counter intentional underhydration. Medics should encourage individuals to drink sufficient water. Protesters (and medics) should bring at least 1 L of water for themselves, or better yet, athletic drinks with electrolytes. Medics are massively outnumbered by non-medics, and their bags are typically already full of medical gear, so they likely cannot carry enough water bottles to hand out. Medics may help run aid stations where this is feasible, or they may coordinate with other helpers to carry water to pass out to participants.

Acclimatize. Participants should spent 1 to 2 hours outside in the weeks leading up to a hot action. Even without exercising it heat, individuals will have some acclimatization.

Medics may see increased numbers of heat injuries during warmer weather early in the spring and summer as well as the first hot days of summer due to a lack of acclimatization. This is somewhat anecdotal, but it is supported by evidence from mass participation running events.[168,169] Mass mobilizations that draw people from different regions may also have increased risk as they may be neither adequately prepared for the weather nor acclimatized.

[ii] The protesters in Hong Kong during the unrest of 2019–20 have found great success in using umbrellas to create a modern testudo formation.

Avoid alcohol. Alcohol is a diuretic and will lead to increased water loss. It is also a CNS depressant and will lead to impaired thermoregulation. Anecdotally, some participants feel that as long as they are drinking *something* they are hydrating, so they will not drink the required additional non-alcoholic fluids.

Know which medications and drugs increase risk. Some medications and recreational drugs increase the risk of heat illness. Taking medications such as antihistamines, beta blockers, calcium channel blockers, and anticholinergics is a risk factor.[165] Use of recreation drugs such as MDMA (ecstasy), cocaine, and amphetamines also is a risk factor. Medics will not be able to memorize a complete list of all drugs and medication that put individuals at risk of heat illness. They best they can do is remind the community to check their medication's side effects for warnings about increased body temperature or decreased sweating.

Protect yourself. Medics may have more gear than other participants. A large backpack means less surface area for evaporative cooling. The added weight means additional exertion relative to other participants. Carrying and wearing personal protective equipment may also put medics at risk for heat illness. Medics can only help injured protesters if they are uninjured themselves. Remember to stay hydrated and stay cool.

Dehydration

Dehydration is a state of deficiency of the total amount of water in the body. Dehydration may be caused by sweating, vomiting, diarrhea, or increased urination as result of illness or taking diuretics. Causes of dehydration at actions tend to be prolonged exposure to heat, insufficient hydration, and the consumption of alcohol.

Signs and Symptoms

Classic signs and symptoms of mild to moderate dehydration are thirst and a dry or sticky mouth, however a person may still be dehydrated without experiencing thirst. Other signs are dark yellow urine, headache, muscle cramps, and skin that is dry and cool.

Signs and symptoms of severe dehydration are decreased or absent urine output, very dark urine, dizziness, tachycardia, tachypnea, sunken eyes, lethargy, and syncope. Patients with severe dehydration may go into hypovolemic shock. As electrolytes in the body become imbalanced, patients may have seizures.

Treatment

Treatment for dehydration is rehydration.

If the patient can drink on their own, give them, water, sports drinks with electrolytes, or oral rehydration solution. Soda and full-strength juice are not recommended in patients with diarrhea. Do not rehydrate patients using drinks containing alcohol. Patients should not be given solid foods until they are rehydrated as this can worsen dehydration.

The ideal method of rehydration is oral rehydration therapy which uses a mixture of oral rehydration salts (ORS). The World Health Organization (WHO) formula is found Table 22.1. A simplified recipe uses 1 L of water, 25 g of sugar (approximately one handful), and 3 g of salt (approximately one pinch).

Table 22.1: WHO Formula for ORS[170]

Ingredient	**Amount**
Water	1 L
Sodium chloride	2.6 g
Glucose, anhydrous	13.5 g
Potassium chloride	1.5 g
Trisodium citrate, dihydrate	2.9 g

Urban Legends

Medics generally operate in environments with readily available potable water. However, during wilderness actions, there may be situations where water is not available, and individuals may attempt to resort to survivalist urban legends.[iii] These include drinking seawater and drinking one's own urine.

Drinking seawater. As with many things in the are of medicine, the answer is complex.

> How much seawater can one ingest before it becomes lethal? The practical answer to this question is "None" but the

---

[iii] Yes, I fully understand the irony of describing "wilderness" "urban" legends.

> scientifically correct answer is "It depends."[164]

It is obvious that it depends on one's current hydration and body size. A well hydrated person can, of course, swallow one mouthful of seawater without harm. However, when considering that the goal of consuming seawater is to increase the amount of body water, it should be remembered that the salt content of seawater prevents this. Stated clearly, "net gain of body water cannot occur by imbibing unadulterated seawater."[164] If one is at risk of dehydration or is already dehydrated, absolutely no seawater should be consumed.

Drinking urine. Urine contains waste products the body is intentionally trying to remove. Beyond a certain level, which certainly has been crossed if dehydration is a risk, the amount of solute in urine exceeds what the kidneys can process. Thus, like the consumption of seawater, the consumption of urine leads to additional dehydration.

Minor Heat Illnesses

Minor heat illness range from merely bothersome to requiring prompt assistance.

Heat Edema

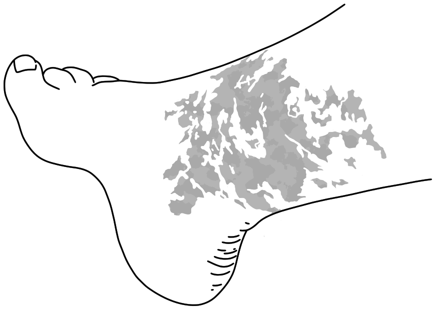
Heat edema is swelling the feet, ankles, and hands when individuals are exposed to a hot environment. This typically occurs within the first few days and is most common in elderly, unacclimatized individuals. Heat edema is not dangerous, and treatment is not required. The body part may be elevated or compression socks or stockings may be used.

Heat Rash

Heat rash occurs when sweat glands become plugged and rupture causing vesicles (small, fluid-filled sacs) to form under the skin. The rash is often located on the chest, neck, and anywhere with skin folds such as the elbow creases or under the breasts. It may also be found in places where the body rubs against clothing including the shoulders (from backpack straps) or ankles (from tight boots). Repeated cases of heat rash cause a deeper vesicles to form.

Signs and symptoms. Heat rash (Figure 22.1) is a skin disease characterized by small, red, itchy rashes that possibly include white bumps. The affected area may not be sweaty (anhidrosis). Heat rash is also known as miliaria, prickly heat, and sweat rash. Heat rash is often mistaken for shingles (herpes zoster).

Figure 22.1: Heat Rash[12]



Treatment. Treatment includes topical use of calamine lotion to reduce itching. Scrubbing the affected area with salicylic acid can help relieve symptoms. Symptoms typically resolve on their own when the patient is removed from a hot environment.

Heat Cramps

Heat cramps are painful, involuntary muscle spasms typically in the calves but may be in the shoulders or thighs. They are most common in unacclimatized individuals who have been exercising and individuals who have been sweating profusely and replaced the lost fluid with water or other hypotonic fluids.[80] Cramps may appear during exercise, but more commonly when resting after exercise.

Treatment. Treatment is to move the patient to a cool location and administer fluids and salts. Fluids should be isotonic or even hypertonic.[165] Athletic drinks with electrolytes, especially those with sodium, potassium, and magnesium, are preferred to rehydrating with water. Slowly and gently stretching the affected muscle helps relieve cramps. The patient should avoid exercise after recovering to prevent a recurrent injury.

Do not massage the muscle. This may make the cramps worse. Do not administer salt tablets by themselves as this may cause nausea and vomiting.[80] Salt tablets may be dissolved in water then administered.

Heat Syncope

Heat syncope is dizziness and fainting due to hyperthermia. It is caused by hypotension as a result of systemic vasodilation and the pooling the blood in the legs.

Individuals who are not acclimatized or are dehydrated are at increased risk for heat syncope. Standing still for a prolonged periods is also a risk factor. Individuals at risk for heat syncope should flex their legs to prevent subcutaneous blood pooling.[165]

Signs and symptoms. In milder forms, symptoms may simply be headache, tunnel vision, or malaise. Patients may suddenly collapse in the heat.

Treatment. Treatment is similar to that of heat stress (discussed later in this chapter). If the patient fainted and fell, check their ABCs before administering other treatments. Treat the patient as if they have heat stress. When the patient is able drink, have them sit up, and administer isotonic fluids or water to them. When the patient has recovered, assist them with standing. The act of standing may cause their blood pressure to drop again as gravity causes blood to pool in their legs (orthostatic hypotension). Patients who have fainted should avoid strenuous exercise.

Consider hypoglycemia. Anecdotally, medics may find that patients with heat syncope are also mildly hypoglycemic. This seems to be due to a general unpreparedness for demonstrating in the heat and seems to be most common in youthful patients (approximately under 25). Patients who are unprepared usually have not eaten or drank enough during the day and as result are generally “just not functioning well.” Consider measuring their blood glucose and administering a small amount of sugary food or drink along with the rest of the treatment.

Major Heat Illnesses

Minor heat illnesses are self correcting or do not require treatment, but major heat illnesses can be fatal if left untreated.

Heat Stress

Heat stress, also known as heat exhaustion, is a syndrome of non-specific symptoms caused by heat exposure that is generally characterized by malaise. It is itself not dangerous, but it is a precursor to heat stroke and should be preemptively treated.

Heat stress can be caused by water depletion, sodium depletion, or both. Water depletion is typical for the elderly or those working in hot environments. Sodium depletion is typical for unacclimatized individuals who rehydrate with hypotonic solutions.

Signs and symptoms. Heat stress is characterized by the symptoms of heat cramps and heat syncope along with symptoms of dehydration. In particular this means the patient may have nausea, headaches, malaise, dizziness, orthostatic hypotension, and tachycardia. Core temperature may be normal or elevated, but is typically not above 40 °C. A key differentiation between heat stress and heat stroke is that heat stroke lacks the central nervous system (CNS) abnormalities that heat stroke has.

Heat Stroke

Heat stroke is characterized by a core temperature over 40 °C and an altered mental status. Heat stroke has a high mortality rate and is fatal if left untreated.

Signs and symptoms. Signs of heat stroke include all of the signs and symptoms of heat stress. It is falsely believed that patients with heat stroke stop sweating, though this is true in less than half of cases.[80] The main finding that characterizes heat stroke compared to heat stress is altered mental status. This may include impaired voluntary motor control (ataxia), irritability, confusion, hallucinations, delirium, abnormal posturing, seizures, and coma. Additionally, seizures may occur while cooling the patient.

Treatment of Major Heat Illness

Neurological damage from hyperthermia is a function of maximum temperature reached as well as duration of hyperthermic temperature.[80] For this reason, it is critical to rapidly cool the patient. Patients who are only heat stressed need to be rapidly cooled to prevent heat stroke from developing.

Remove the patient from the source of heat. Promptly move the patient to a cooler area. At a minimum, move them to the shade. If possible, find a shady grass area as this will be cooler than pavement. You may be able to use an apartment foyer or climate controlled business. If you cannot find shade, use an emergency blanket held at a distance greater than 1 m to create shade.

Remove excess clothing. Loosen or remove clothing and bags to both facilitate evaporative cooling and reduce insulation. If the patient is heat stressed, you may be able to take the time to remove the clothing carefully so they can don it later. Use trauma shears to cut away the clothing in patients with heat stroke.

Check their blood glucose. The patient may not be have heat illness and may be hypo- or hyperglycemic. Check the patient's blood glucose. If you are unable to check it, administering glucose will not worsen hyperglycemia and it will help in other cases. Glucose should be administered only if the patient has a LOC that permits it and with sufficient water to prevent worsening dehydration.

Cool the patient. If the patient is heat stressed, passive cooling may be effective. Douse the patient with cool water and fan them.

If the patient has heat stroke, active cooling is needed. Cover as much of the patient's body with bags of ice as possible. Slightly fill the bags with water to increase the surface area in contact with the body. This increases conductive cooling. Instant cold compresses do not cool enough to be used alone, though their use is better than nothing. Urban legend suggests placing them along large arteries and veins cools the blood as it passes, but this is false, and it is more effective to place the bags on the palms of the hands, soles of the feet, and cheeks.[165]

Cold water immersion therapy is the most effective method of cooling a patient in the field. If a bath is available, fill the bath with ice water and place the patient in it ensuring to keep their head above water. This method is unlikely to be available to medics, but is is included as getting a patient to a hospital may be impossible.

To prevent overcooling and related complications, the patient should not be cooled to a core temperature below 39 °C.[165]

Rehydrate. If the patient is able to drink, give them isotonic fluids, or if this is unavailable, give them water.

Avoid antipyretics. Antipyretics (fever reducing medication) such as ibuprofen, aspirin, or paracetamol should not be administered. They operate by overriding chemicals in the hypothalamus in order to lower the body's hypothalamic set-point. When the body is overheating from an outside source, this has no effect.

Consider evacuation. If you suspect a patient has heat stroke, they should be immediately evacuated to advanced medical care. Attempt to cool the patient while you wait for evacuation.

Summary

Many heat illnesses are merely nuisances, but heat stroke has an acute onset and high morbidity. It requires rapid cooling and evacuation to advanced medical care.

Luckily, many heat illnesses can be prevented by appropriate clothing, hydration, and acclimatization. Encouraging comrades to spend time in the heat prior to actions and bring plenty of water will help minimize heat illnesses.

If a patient appears to be overheating and has altered mental status, check their blood glucose. If this is not possible, assume heat stroke and immediately evacuate them to advanced medical care.

23 : Respiratory and Cardiac Emergencies

> I set aside my broken heart and I heal the only way I know how–by being useful. I efficiently compartmentalize my pain. . . And I joyfully go about this work.
>
> Willem van Spronsen[171]

Along with wound management, recognition and treatment of respiratory and cardiac emergencies are the basis of most first aid courses. These illnesses are often taught as primarily happening to individuals with genetic dispositions or in populations of high risk such as the elderly. During actions, respiratory and cardiac emergencies may additionally happen as a complication from other injuries. Traumatic chest injuries can lead to cardiac arrest, and exposure to riot control agents can lead to an asthma attack.

Asthma

Asthma is a long term disease of the airways of the lungs that results in restricted airflow and difficulty breathing. The development of asthma may be caused by exposure to pollution, cigarette smoke, molds, allergens, and certain chemicals.[i] The main physiological changes are constriction of the smooth muscles of lower respiratory tract (bronchospasm), bronchial wall edema, and thick secretions into the airway.[80] This narrowing of the airway is exists on a spectrum from acute airway obstruction to the remodeling of lung tissue leading to permanent loss of lung function[80] (though this happens over a longer time and is not something medics need to be concerned with). Asthma exacerbation (Figure 23.1), commonly known as an asthma attack, is an acute reversible state that may return to normal spontaneously or with the help of medication.

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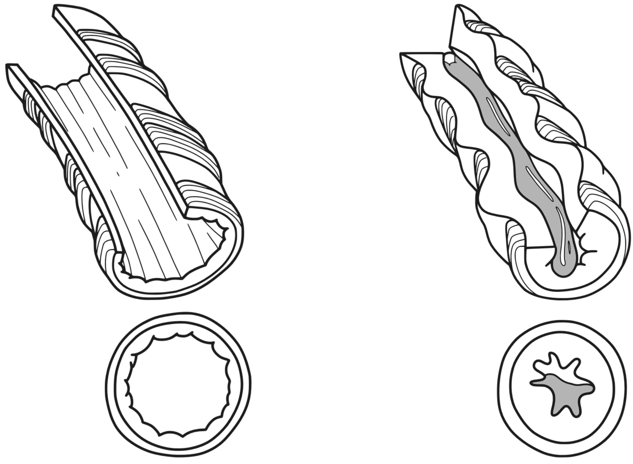
[i] "Western lifestyle" is also cited as a factor that contributes to the development of asthma,[80,172,173] so for all their whining about "creating the modern world," dumbfuck white supremacists are literally ruining everyone's health because of their insistence

Figure 23.1: Airway Cross Section[12]



(a) Normal (b) During asthma attack

Signs and Symptoms

In general, signs and symptoms of asthma exacerbation include shallow breathing (dyspnea), wheezing, and coughing. Patients may be hunched over and unable to speak more than short sentences.

Early signs are a complaint of chest tightness and constriction as well as coughing. As asthma exacerbation progresses, the patient may begin wheezing, have a prolonged expiration phase (inspiratory to expiratory ratio of at least 1 to 3), use accessory muscles to assist with breathing effort, and become cyanotic. Wheezing may, however, only be audible with a stethoscope. The patient's heart rate and respiratory rate may be elevated (tachycardia and tachypnea). As asthma progresses, the use of accessory muscles due to diaphragmatic fatigue can cause paradoxical breathing[ii] where the abdomen protrudes and the chest deflates during inspiration. Paradoxical breathing and altered mental status such as lethargy and confusion are signs of impending respiratory arrest.[80]

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on pursuing some myth. Civilization as we know it is an untenable goal, and we should radically rethink how we structure our society.

[ii] Paradoxical breathing is an overloaded term that describes two different phenomena. Paradoxical breathing due to diaphragm fatigue should not be confused with the paradoxical breathing due to flail chest. For the latter, see Chapter 16 ("Chest Injuries").

There are other conditions medics may encounter that mimic asthma, so you should attempt to perform a differential diagnosis to help guide treatment. Conditions with similar signs and symptoms include upper airway obstruction, aspiration of foreign bodies or gastric acid, and multiple pulmonary emboli.[80]

Treatment

Treatment is optionally administer medication, to monitor the patient for signs of improvement or deterioration of their condition, and to consider evacuation to advanced medical care.

Move the patient away from irritants. The patient should be moved away from sources of irritants such as riot control agent, pollen, or dust.

Decontaminate the patient. If the patient is covered in allergens, do what you can to remove the allergens. Specific steps for this can be found in Chapter 13 ("Riot Control Agent Contamination").

Sit the patient leaning forward. In order to facilitate the use of the accessory muscles of respiration, sit the patient in a chair, have them lean forward, and position their hands on their knees. This will give them stability for breathing. Patients may instinctively want to lay down, but this should be avoided.

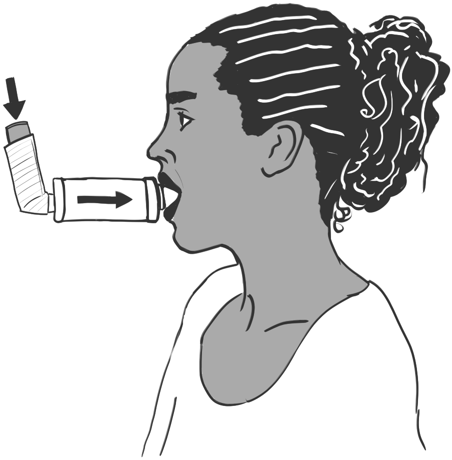
Remove constricting clothing. If the patient is wearing clothing that could constrict their breathing or a backpack, remove and loosen what you can. This will make it easier for them to breath, and will make it easier to perform basic life support should they go into respiratory or cardiac arrest.

Consider administering bronchodilators. Bronchodilators are fast-acting medications that dilate the bronchi and bronchioles. These are often inhaled via a metered dose inhaler (MDI), commonly salbutamol (albuterol). Inhalation of the medication is improved by the use of a spacer chamber (Figure 23.2).

If the patient is asthmatic, consider helping them self administer their medication as they may be panicked or have an altered mental status. If you carry salbutamol, consider offering it to them following the guidelines in Chapter 9 ("Medication").

When assisting with administering inhaled bronchodilators, shake the MDI, attach it to the spacer, and depress the cannister. The patient should inhale deeply and hold their breath for 5 to 10 seconds. Dosing will vary depending on the device and medication, though a reasonable rule to guide treatment is 2 puffs every 5 minutes, up to a total of 12

Figure 23.2: Inhaler Usage[9]



puffs.[98]

Coach the patient on breathing. Regulating the patient's breathing can help both calm them and relieve symptoms without medication. Coach the patient on the pursed lip breathing technique using the following steps:

1. The patient sits up right and relaxes their neck and shoulders.
2. They inhale through their nose for 2 seconds. Their mouth should be closed.
3. They purse (pucker) their lips as if blowing out a candle or whistling and exhale for 4 seconds.
4. This is repeated until symptoms subside.

The increased pressure during the expiratory phase helps open the airways of the lungs. The deep inhalation and exhalation helps force out the "stale" air in their lungs.

Provide humid air. Warm, humid air will help clear lung mucus. If possible, move the patient somewhere with warmer and more humid air. During remote actions, consider boiling water on a camp stove and having the patient breath the humidified air.

Consider administering epinephrine. If the patient is having a severe asthma attack that does not respond to bronchodilators, they have status asthmaticus. Consider using an epinephrine autoinjector to administer a single dose of epinephrine.[80]. See Chapter 24 ("Allergies and Anaphylaxis") for instructions on how to do this.

Consider evacuation. If the patient has an altered mental status or is not improving after several minutes, evacuate the patient to advanced medical care.

Hyperventilation

Homeostasis of blood pH is complex and involves a number of systems, though it can be rapidly affected by respiration. When carbon dioxide is dissolved in water creates carbonic acid (H_2CO_3). Carbon dioxide in the blood affects pH by making it more acidic. During respiration, carbon dioxide is eliminated from the blood making it more alkaline.[98] Small variations in the amount of carbon dioxide dissolved in the blood are buffered by the bicarbonate buffer system.

Hyperventilation is increased respiratory rate or tidal volume that eliminates carbon dioxide from the blood faster than the body generates it. Respiratory alkalosis is a decrease in the partial pressure of carbon dioxide in the blood (hypocapnia) due to an increased respiration. Hypocapnia causes cerebral vasoconstriction leading to ischemia and cerebral hypoxia.[174] Prolonged hyperventilation also leads to respiratory alkalosis.

Hyperventilation is often psychological in origin (stress, anxiety, panic), though it may be the result of brain damage (trauma, stroke), respiratory disorders (asthma, pneumonia), or cardiovascular disorders (pulmonary embolism, anemia). Hyperventilation can happen as a result of injury regardless of severity, or it may happen after a traumatic situation in uninjured individuals. Even before an action really kicks off, the presence of large crowds or police issuing warnings can lead to stress and hyperventilation, so medics should keep an eye out for panicked demonstrators.

Signs and Symptoms

Patients may appear panicked, stressed, and anxious, though this is often the origin of the hyperventilation and not a symptom of it. Typically the only visible sign is increased respiratory rate (tachypnea) or both increased respiratory rate and depth (hyperpnea).

Cerebral hypoxia due to hypocapnia can cause a feeling of light headedness and additional feelings of anxiety. Patients may report a feeling of suffocation despite having a clear airway and normal blood oxygen saturation. Cerebral hypoxia may eventually lead to syncope.

Due to respiratory alkalosis, patients may have a tingling feeling (paraesthesia) in their hands and around their mouth. As respiratory alkalosis progresses, calcium ion imbalances leads to cramping and painful muscle spasms in the hands and feet (carpopedal spasms). The patient's hands may curl inward and become unusable (tetany). The patient may have stabbing pain in their chest.

Treatment

Treatment is to calm the patient and help them regulate their breathing breathing.

Calm the patient. Help treat the patient's stress or anxiety by calming them and offering reassurance. Tell the patient that they need to slow their breathing and that you are there for them. Explain to them that the symptoms they are feeling will go away once they start breathing normally.

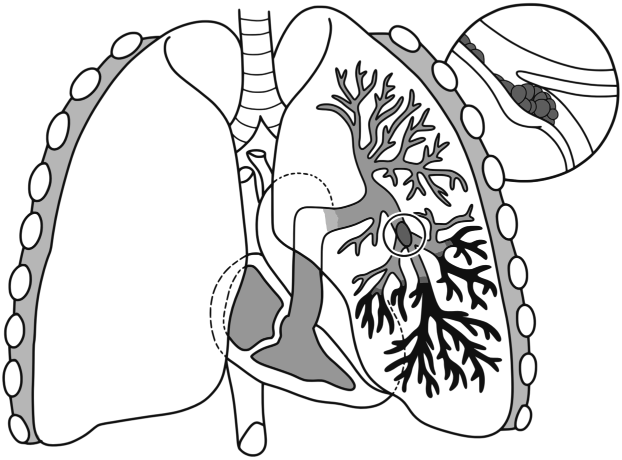
Regulate their breathing. Coach the patient on breathing to help them regulate their respiratory rate. One option is to have them purse their lips and breath through a reduced opening. Another is to get them to exhale for longer than they breath in. This is often done through the 7/11 technique of breathing in slowly for 7 seconds followed by breathing out slowly for 11 seconds. The patient should continue controlled breathing until symptoms subside.

Avoid use of bag rebreathing. Urban legend suggests that patients should breath into a plastic or paper bag. This has the effect of increasing the amount of alveolar carbon dioxide, though experimentally it does not lead to a change in the time until the disappearance of symptoms, thus leading to the idea that bag rebreathing is beneficial due to primarily psychological reasons.[175] While this treatment may be appropriate for patients who are hyperventilating due to anxiety, if it is erroneously applied to patients who are hyperventilating due to hypoxemia (low oxygen in the blood), it is "capable of producing sudden deterioration and death."[176] Medics should not use bag rebreathing to treat hyperventilation.[98]

Pulmonary Embolism

An embolism is the obstruction of a blood vessel by foreign matter such as a blood clot (thrombus) or gas bubbles. A thrombus may form somewhere in the body, break off, and travel through blood vessels lodging somewhere else. Deep vein thrombosis is the formation of a thrombus in the deep veins of the body, often in the legs or pelvis. Thrombi that form in the legs can break off, travel through the right chambers of the heart, and lodge in the arteries of the lungs. This is called a pulmonary embolism. Most pulmonary embolisms are caused by deep vein thrombosis in the legs, pelvis, and arms.[80]

Figure 23.3: Pulmonary Embolism[12]



The biggest risk factor for venous thromboembolism is prolonged limb immobility in two contiguous joints.[80] Medics may see this during occupations, during lock-ons, or following long distance travel (6 continuous hours or more). Other risk factors include being over 50 years old, smoking, obesity, and taking estrogen (such as in contraceptives).

Signs and Symptoms

Patients may have sudden onset chest pain accompanied with shortness of breath (dyspnea). Chest pain may be focal to the location of the embolism. Pain may increase during inspiration. The patient may sweat; have pale, cool, clammy skin; and go into shock. They may develop respiratory distress and become cyanotic, especially cyanosis of the lips and fingernail beds. However, the presentation of a pulmonary embolism may only be rapid onset shortness of breath and coughing.

Pulmonary embolism may present similar to other illnesses such as cardiac problems and pneumothorax. However, for all of these illnesses, treatment is evacuation.

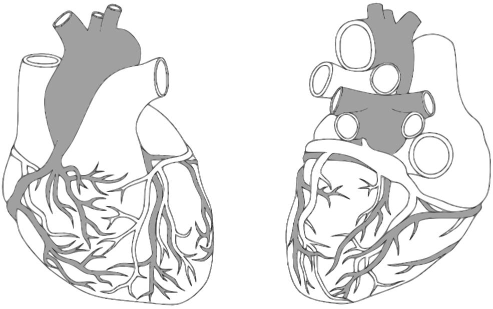
Treatment

As a medic, you cannot treat a pulmonary embolism. Assist the patient with breathing, and monitor their ABCs. Treat for shock. Evacuate the patient to advanced medical care.

Cardiac Chest Pain

Chest pain can be very cryptic as it can have many origins. It may be related to comparatively innocuous injuries and illnesses such as a strained muscle, gastrointestinal distress, or rib fracture. Other times it is related to life-threatening medical conditions like heart dysfunctions.

Figure 23.4: Coronary Circulation[177]



Acute coronary syndrome (ACS) is a set of symptoms associated with reduced blood flow of the coronary arteries causing heart muscle to malfunction and die. One cause of ACS is myocardial infarction (heart attack) where the arteries that supply the heart with blood become blocked. Another cause is a sudden reduction blood flow (ischemia) of the heart muscle (unstable angina).

Angina pectoris, often just angina, is chest pain due to ischemia of the heart muscle. Stable angina is ischemic related chest pain that is brought on by exercise but abates shortly after stopping exercise. Unstable angina is ischemic related chest pain that occurs when the patient is at rest, that is new and severe, or that has increasing severity or frequency.

Signs and Symptoms

So-called “classic cardiac chest pain” is often described as crushing pressure or a feeling of tightness in the chest that radiates toward the left arm and up toward the jaw. Patients with ACS do not always present with these symptoms, and some may have no pain at all. This is especially true of women, non-white individuals, diabetic individuals, and elderly individuals.[iii] There are a number of signs and symptoms that indicate acute coronary syndrome, however a diagnosis, even by professionals, can be tricky and requires diagnostic equipment not available to medics. This difficulty arising from the variation in presenting symptoms can be more clearly stated as such:[80]

> There are no historical features with sufficient sensitivity and specificity to either diagnose or exclude acute coronary syndrome.

Patients with ACS may have pain that is crushing and vice-like, a feeling of pressure, a feeling of chest tightness, or aching pain. The pain may also be sharp and stabbing, and may be located in the chest, upper back, or shoulders. The pain may radiate into either arm, both arms, or up into the neck and jaw. Exertion may exacerbate this pain. Cardiac chest pain in women may include upper abdomen pain and nausea.

Patients may have shortness of breath (dyspnea); have pale, cool skin; be sweating; or have nausea and be vomiting. They may have feelings of anxiety, being grossly unwell, or impending doom (angor animi).

Treatment

Patients with cardiac chest pain need to be examined by a physician, so a medic's job is to provide basic care and facilitate evacuation to advanced medical care. Interview the patient about their medical history, and attempt to determine if the chest pain can be explained by non-cardiac factors.

Calm the patient. Calm the patient and find somewhere for them to sit comfortably. Helping the patient relax will reduce strain on their heart.

Consider administering aspirin. If you carry medication, consider administering aspiring in line with the guidelines in Chapter 9 ("Medication"). If the patient is not allergic to aspirin and has not had recent gastrointestinal bleeding, have them to chew 160 to 325 mg of aspirin.[178] Chewing the tablet accelerates delivery of the medication.

Remind patient to take heart medication. If the patient has medication for cardiac chest pain such as nitroglycerin, remind them to take their medication. Nitroglycerin comes in tablets that are placed under the patient's tongue, as a spray that is sprayed under the tongue, or as a topical medication that is applied to the skin.

[iii] Funny how "typical" seems to always mean middle aged, white men, innit?

Treat for shock. Patients with cardiac chest pain may go into cardiogenic shock. Treat for shock as described in Chapter 14 (“Shock”).

Evacuate the patient. Promptly evacuate the patient to advanced medical care.

Summary

Respiratory and cardiac emergencies can be life-threatening and may rapidly escalate from unwellness to deadly. Asthma can be treated with breathing techniques and salbutamol, and in extreme cases it can be treated with epinephrine. Hyperventilation should be treated by calming the patient and coaching them on breathing, but not with bag rebreathing. Chest pain that cannot be explained by another injury or illness and respiratory distress that does not quickly improve are grounds for evacuation to advanced medical care.

24 : Allergies and Anaphylaxis

> I shit on all the revolutionary
> vanguards of this planet.
>
> Subcomandante Marcos[179]

Allergic reactions are caused by a hypersensitive immune system overreacting to harmless (or minimally harmful) substances. In many cases, these reactions are only bothersome inconveniences manifesting as sneezing or itchy eyes. However, this hypersensitivity is a spectrum with the severe end being anaphylaxis. Anaphylaxis can be deadly if a patient's airway swells and closes or if they go into shock.

Medics will not often encounter allergic reactions during actions. When they do, such reactions are typically the result of ingestion of allergens, insect stings, or contact with allergenic plants.

Physiology

Our immune system is our body's complex set of structures and processes it uses to defend itself against pathogens. At the most basic level, the immune system includes things such as the skin (which acts as a sealed barrier) and the act of coughing (which mechanically ejects pathogens from the lungs). Our bodies secrete antimicrobial peptides and enzymes, and symbiotic flora in our gastrointestinal tracts can prevent the growth of infectious bacteria. A more complex response is the release of histamine which causes vasodilation, allowing white blood cells to move through capillaries to fight pathogens. This leads to inflammation and increased blood flow to the affected tissues. Fever is another response that makes the body less hospitable to infectious diseases. The body has an adaptive immune system that learns to recognize pathogens leading to increased immune response when that pathogen is subsequently encountered.[i]

An allergic response is caused by hypersensitivity of the immune system leading to an immune response to otherwise harmless substances. Antibodies bind to the allergen and trigger an excessive release of histamine leading to inflammation. Common allergens are food (such as nuts or shellfish), pollen, dust, pet dander (material shed from the pet's body), and insect stings. Often allergies are mild and may simply present as hay fever (allergic rhinitis), inflammation, or localized edema. In more serious cases, the release of histamines cause broncoconstriction. This, combined with swelling of the airway, can lead to asphyxiation, and global vasodilation can lead to anaphylactic shock.

---

[i] This is the basis of vaccination.

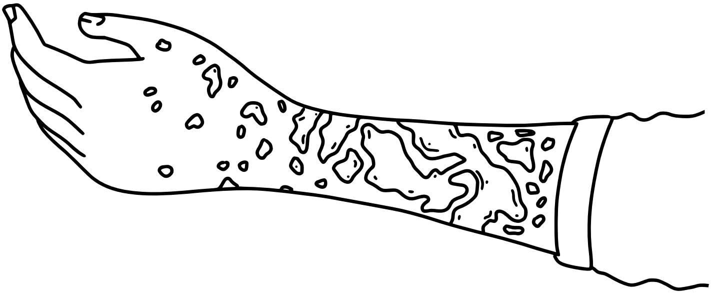
Mild to Moderate Allergic Reactions

Mild and moderate allergic responses may manifest as a global response to allergens or the symptoms may be localized.

Hay fever. Signs and symptoms of hay fever includes a runny nose and sneezing. The patient's eyes may be red, swollen, and itchy. They may have increased tear production.

Local allergic response. In the case of strings of contact with allergens, symptoms may be localized to the site of contact. Signs and symptoms of a local allergic reaction include redness of the skin, swelling, and itching. The skin may develop hives and welts around the site of contact (Figure 24.1). The development of hives may be global such as after ingestion of an allergen.

Figure 24.1: Localized Hives[12]



Treatment

Treatment for mild to moderate allergic responses is to remove the allergen from the patient and consider administering medication.

Remove the allergen. If the patient is having an allergic response to something in the environment such such as dust, pollen, or riot control agent, move the patient to a location free of the allergen. Consider removing clothing that is contaminated, and consider using water to decontaminate the skin and eyes. Give the patient tissues, and have them blow their nose. Extended discussion of decontamination can be found in Chapter 13 ("Riot Control Agent Contamination").

If the patient has been stung by an insect, the stinger may continue to inject venom into the patient. Some stingers may contain a venom sac that protrudes from the end of the stinger. Leaving this sac or stinger in place or squeezing it during removal may release additional venom. Using a knife, trauma shears, or a plastic card (bank or ID), scrape away the venom sac and stinger.

Apply a cold compress. In the case of insect stings or bites, after removing the stinger, or if removing the stinger is not possible, give the patient a cold compress to hold on the affected area.

Consider administering antihistamines. If you carry antihistamines, consider administering them to the patient. Note that many first generation antihistamines (and many second generation antihistamines) can cause drowsiness.[ii] Depending on the nature of the action, patients who are given antihistamines should be sent home for their own safety.

Consider administering salbutamol. If the patient is asthmatic, remind them they they may want to use their own inhaler. If you carry a salbutamol inhaler, consider letting the patient self administer. Additional instructions for treating asthma can be found in Chapter 23 ("Respiratory and Cardiac Emergencies").

Monitor their airway. Monitor the patient's airway looking for signs of respiratory distress or swelling of the lips, tongue, and throat. Swelling may indicate anaphylaxis and requires immediate evacuation to advanced medical care.

Severe Allergic Reactions

Anaphylaxis is a severe allergic reaction that has rapid onset, sometimes within minutes of exposure to the allergen. Anaphylaxis is a medical emergency.

Note that anaphylaxis is a clinical diagnosis with specific clinical criteria.[80] For riot medics, simplified diagnosis criteria is used to guide treatment: it if looks like anaphylaxis, it is safe to treat it as if it is.

[ii] First generation antihistamines include diphenhydramine (Benadryl) and doxylamine (Unisom). Second generation antihistamines include cetirizine (Zyrtec) and loratadine (Claritin). Third generation antihistamines include desloratadine (Clarinex) and fexofenadine (Allegra).

Signs and Symptoms

Anaphylaxis typically begins with itchy skin (pruritus), flush skin, and hives. Early signs and symptoms may include the symptoms of mild and moderate allergic reactions such as a runny nose, and swollen, itchy eyes.

This progresses to edema of the throat and airway that is often described as feeling of fullness or a lump in one's throat, and the patient may be hoarse. They may have visible swelling of their lips, tongue, and uvula.

The patient's chest may become tight, and they may have a shortness of breath. Patients may have constriction of airways of the lower respiratory tract (bronchospasm).

Other symptoms may be abdominal pain or cramps, nausea, vomiting, and diarrhea. Histamine release leads to vasodilation which can lead to hypotension.

As anaphylaxis progresses, the patient may have respiratory distress, decreased level of consciousness, and respiratory arrest.

After initial treatment and recovery, patients may develop delayed anaphylaxis. The peak of these symptoms are 8 to 11 hours after the initial exposure to the allergen, and they typically begin 3 to 4 hours after the patient's initial symptoms have cleared.[80] This phenomenon appears in 4 to 5% of patients.[80]

Treatment

Initial treatment principles for severe allergic reactions and anaphylaxis are the same as for mild allergic responses. Patients should be removed from the allergen and decontaminated if possible.

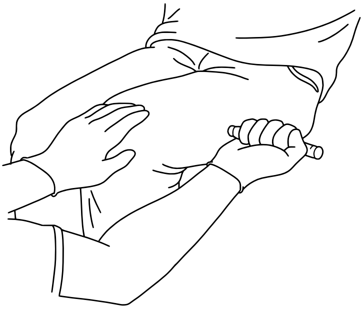
Consider administering antihistamines. Because the patient's throat and airway may rapidly close, consider quickly administering antihistamines while the patient is still conscious and can still swallow. Some antihistamines come in a dissolvable form that can be placed under a patient's tongue.

Consider administering epinephrine. Patients with a known allergy may have an epinephrine autoinjector for use during emergencies. In order to facilitate rapid use by laypersons, autoinjectors are designed to pierce clothing. Note that there are many types of autoinjectors, so you should familiarize yourself with the different autoinjectors available in your region. Use the following steps to administer epinephrine:

1. Remove the autoinjector from its case.
2. Grip the injector in one hand so that the injector tip is facing down.
3. Remove the safety release by pulling, not twisting or bending.

4. Depress the autoinjector against the outer middle third of the patient's thigh, and hold the autoinjector in place for 10 seconds. There is an audible click as the autoinjector activates.
5. Remove the autoinjector, and massage to the injection site for 10 seconds.
6. Safely dispose of the autoinjector.

Figure 24.2: Epinephrine Injection[12]



Treat for shock. Treat the patient for shock. For more information, see Chapter 14 ("Shock").

Evacuate. The patient should be immediately evacuated to advanced medical care. Even if they recover and are able to breath on their own or symptoms appear to have cleared, the possibility of biphasic anaphylaxis or other underlying conditions requires that they see advanced medical personnel.

Summary

Treatment for allergies and anaphylaxis are simple. Remove the allergen, decontaminate the patient, and consider antihistamines, salbutamol, and epinephrine. Monitor for anaphylaxis and worsening allergic reaction. Immediately evacuate patients who show signs of anaphylaxis to advanced medical care.

25 : Blood Glucose Disorders

> Fascist scum / Expected a parade /
> Your welcoming committee / Was an
> antifa brigade
>
> G.L.O.S.S., *Fight*[180]

For the human body to function and remain healthy, blood glucose levels need to remain within a narrow range. The human body naturally maintains this range through different hormones, but disease and improper nutrition can cause unhealthily high and low blood glucose. Eating too little, especially combined with exercising can lead to low blood sugar levels causing fatigue. Diabetes can cause high blood glucose, and its management can overcorrect and lead to low blood glucose. Hundreds of millions of individuals worldwide live with diabetes, and medics should be familiar with the disorder in order to assist with treatment.

It is important to remember that when treating patients with diabetes, the patient understands their body and how to manage their blood glucose levels better than you. They have been living with diabetes for years or perhaps their entire life, and you have just met them. For patients who are alert and oriented, in most cases, your task as a medic is to remind them to eat or ask if they have taken their medication.

Physiology

The physiology behind diabetes and blood glucose disorders is complex. This section will only focus on the variants that medics are likely to encounter.

Blood Glucose Homeostasis

Insulin is an anabolic hormone produced by the beta-cells of the pancreatic islets. Anabolism is the set of metabolic pathways that use energy to build more complex molecules out of smaller units. The presence of insulin promotes the absorption of of carbohydrates into fat, skeletal muscle, and liver cells. Absorbed carbohydrates are turned into glycogen (an energy store made of chains of simple sugars) and triglycerides (fat). As a result of insulin secretion, blood glucose (BG) levels decrease.

Glucagon is a catabolic hormone produced by the alpha-cells of the pancreatic islets. Catabolism is the set of metabolic pathways that breakdown molecules into smaller units either for energy or as part of anabolic reactions. The presence of glucagon causes the liver to convert glycogen into glucose. This increases blood glucose levels.

The beta-cells are sensitive to glucose, and as glucose levels rise, insulin is secreted. The alpha-cells are sensitive to insulin, and as insulin levels rise (and glucose levels drop), glucagon is secreted. When we eat, our blood glucose levels rise for a few hours, and so do our insulin levels, before slowly dropping. Together these two types of cells create a negative feedback loop that keeps blood glucose levels within a narrow range. This is called glucose homeostasis.

Diabetes Mellitus

Diabetes mellitus, commonly called diabetes, is a group of chronic metabolic disorders characterized by hyperglycemia. The two main types of diabetes are Type 1 and Type 2. Type 1 diabetes is characterized by an almost complete lack of circulating insulin and a failure of the beta-cells to respond to insulinogenic stimuli, often caused by the destruction of the beta-cells.[80] Type 2 diabetes is characterized by a relative lack of insulin and failure of target tissues to respond to insulin.[80]

Diabetic Ketoacidosis

The body stores energy as glycogen and triglycerides in adipose tissue. These stores can be metabolized to make glucose available for use. When glycogen stores are depleted, the body breaks down fatty acids to make glucose available. This metabolic state is called ketosis.[i] When this occurs in healthy humans, it is known as physiological ketosis, and BG and blood pH remain normal. In pathological cases, excessive production of ketones can lead to production of acid at a rate greater than can be removed by the kidneys (metabolic acidosis).

Diabetic ketoacidosis (DKA) results from an absence of insulin causing the release of fatty acids from adipose tissue where they are broken down in the liver thus releasing ketones into the blood. The causes the acidification of the blood. DKA is more common in individuals with Type 1 diabetes than Type 2, and it is a life-threatening condition.

Some individuals with diabetes use an insulin pump that delivers a steady dose of insulin through out the day. If their pump fails or is disabled, DKA can develop within an hour.[80]

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[i] This is the basis of Keto (the Ketogenic Diet) and is where the diet gets its name.

Blood Glucose Management

Individuals with diabetes have to take steps to manage their blood glucose levels. This includes diet and lifestyle changes, taking medications, and taking insulin injections. These changes are often guided by use of a blood glucose meter either done by pricking a finger or via continuous monitoring. Discussions of general blood glucose management and long-term symptoms are outside the scope of this book.

Blood glucose is measured either using molar concentration (millimoles per liter, mmol/L) or mass concentration (milligrams per deciliter, mg/dL). The two units are related by a factor of 18 so that 1 mmol/L of glucose is equivalent to 18 mg/dL. The unit used by individuals with diabetes and medical professionals will depend on your region.

Table 25.1: Normal and Target Blood Glucose Levels

Individual	**Fasting BG**	**Post-Meal BG**
Non-diabetic	4.4–5.5 mmol/L (80–100 mg/dL)	4.4–7.7 mmol/L (80–140 mg/dL)
Diabetic	4.4–7.2 mmol/L (80–130 mg/dL)	4.4–10.0 mmol/L (80–180 mg/dL)

Normal ranges for adults without diabetes and target ranges for adults with diabetes can be found in Table 25.1. High BG, often caused by eating too much without taking sufficient insulin, is called hyperglycemia. Low BG, often caused by eating too little or taking too much insulin, is called hypoglycemia. However, neither condition is limited to patients with diabetes, and both are discussed in more detail later in this chapter.

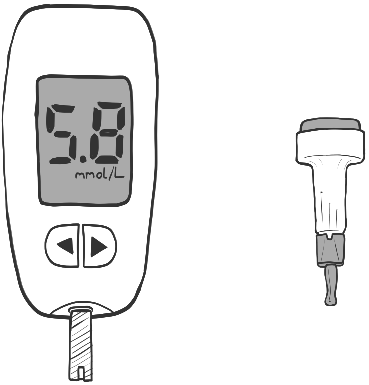
Blood Glucose Testing

There are two main methods of testing blood glucose: fingerprick testing and continuous monitoring.

Continuous monitoring uses a sensor placed under the skin whose readings are read via a monitoring device or mobile phone. The glucose level is taken from interstitial fluid rather than blood, so measurements may lag behind blood glucose levels by 5 to 15 minutes. For this reason, they should not be used as a diagnostic tool during emergencies.

Fingerprick testing involves periodically pricking a finger to draw blood for reading by a glucose meter (Figure 25.1a). Fingerpricking is done with a lancet (Figure 25.1b), either single-use disposable device or reusable lancing device with a disposable lancet tip. Before pricking a

Figure 25.1: Blood Glucose Measurement[9]



(a) Meter (b) Lancet

patient's finger, obtain consent to do so. To measure BG using a glucose meter, use the following steps:

1. Prepare one of the patient's fingers using disinfectant or an alcohol wipe.
2. Prepare your lancet by removing the safety cap and, if applicable, cocking the lancing mechanism.
3. Insert a reading strip into the glucose meter and turn it on.
4. Prick the patient's fingertip with the lancet.
5. Squeeze their fingertip to force out a drop of blood.
6. Hold the end of the test strip against the drop of blood.
7. Read the BG level from the glucose meter.

Blood glucose meters are generally accurate to within 15% of the actual value. This level of accuracy is sufficient for detecting hyperglycemia, but it may not be sensitive enough for detecting hypoglycemia. Patients with a low to normal BG reading can be safely treated as if they have hypoglycemia.

Hypoglycemia

Hypoglycemia, colloquially "low blood sugar," is abnormally low levels of blood glucose. For individuals with diabetes, a BG of 3.9 mmol/L (70 mg/dL) is used as a diagnostic level for hypoglycemia. This number is not absolute, and individuals may have symptoms above this number or may be symptom free below. A diagnosis of hypoglycemia can be confirmed if hypoglycemic symptoms improve following the administration of glucose.

In patients with diabetes, hypoglycemia may be caused by taking too much insulin or anti-diabetic drugs relative to a food consumed. Different insulins have different durations of action, but for many the peak action is between 1 to 4 hours after injection. This is when patients are more susceptible to hypoglycemia.

In general, mild hypoglycemia may be caused by eating too little, prolonged exercise, or alcohol consumption among other causes.

The brain stores a limited amount of glycogen and requires a constant supply of glucose to fuel its high metabolic activity. A reduction in available glucose via lowered BG leads to reduced cognitive function, fatigue, and general weakness. Untreated hypoglycemia can lead to death.

Signs and Symptoms

Early signs of hypoglycemia include hunger, fatigue, weakness, irritability, anxiety, dizziness, and headaches. More obvious early signs are sweating and shaking. Patients may also experience a loss of coordination (ataxia), tachycardia, pallor, and skin that is cool and clammy. As hypoglycemia progresses, patients may have more obvious mental changes including confusion and disorientation. Severe hypoglycemia can result in seizures, coma (commonly called diabetic coma), and death.

Hypoglycemia typically has rapid onset in patients with diabetes and may present with hypothermia.[181] Patients without diabetes may have a more prolonged onset and less severe symptoms. This may present as simply fatigue and irritability (the "hangries"[ii]), but it may also include headaches, nausea, and vomiting.

Treatment

Treatment is to increase the patient's BG and consider advanced medical care.

Administer glucose. This is ideally done by administering glucose (dextrose). Fructose does not cross the blood-brain barrier, and it should be avoided in favor of other glucose-containing carbohydrates.[80] Other options for glucose are sugar (sucrose) and simple carbohydrates such as white bread (with a small amount of water to aid digestion). Protein does not meaningfully increase BG in hypoglycemic patients. Diet soft drinks[iii] are not effective treatment because although they taste sweet, they have no sugar content. If patients are alert and oriented, dextrose tablets, glucose gel, or other sugary food or drink can be administered orally.

[ii] A portmanteau of "hungry" and "angry."

Direct administration. Patients with reduced levels of consciousness or who are unconscious need to have glucose carefully administered by a medic.[98] Once the patient's airway has been managed, place sugary gels or powders under their tongue, between their gums and cheek, and between their gums and lips. Only a small amount of powder or gel should be used to reduce the risk of aspiration. The sugars will be slowly absorbed by the oral mucosa. After administering, medics should continue to monitor the patient's airway.

Do not remove insulin pump. If patients have an insulin pump, do not attempt to remove or disable it as this may rapidly lead to hyperglycemia.[80]

Consider evacuation. Patients without diabetes and minor signs of hypoglycemia (irritability, nausea, vomiting) who recover when treated with food and drink generally do not require evacuation, though they should at least eat a small meal. Patients who are diabetic with minor alterations to their mental state such as irritability and confusion and who recover when given glucose should be recommend to leave the action with a buddy. Evacuate to advanced medical care all patients with significant alterations to their mental state including decreased levels of consciousness and patients whose hypoglycemia cannot be explained by diabetes or eating too little.

Prevention

Individuals with diabetes typically know how to manage their blood glucose, insulin, or other medications. Mild hypoglycemia in individuals without diabetes is often caused by insufficient caloric intake, especially during long actions. During actions that are more fun and celebratory, youthful exuberance and poor planning may lead to insufficient calorie consumption. For more militant actions, pre-action nervousness and adrenaline during actions may contribute to skipping meals.

Individuals and groups you work with should be encouraged to eat before and during actions to prevent hypoglycemia. Hypoglycemia may lead to mental and physical fatigue which may lead to other injuries or arrest. Consider suggesting that people force themselves to eat before actions despite nervousness and a lack of hunger. However, individuals may have stress and anxiety around food or they may have an eating disorder, so recommendations that individuals eat should be carefully phrased, gentle, and nothing more than explanatory of the reasons why one should eat before or during an action.

[iii] Such as those sweetened with aspartame, saccharine, stevia, or sucralose.

This advice applies to medics themselves. Skipping meals and not snacking can make it very difficult to render care.

Hyperglycemia

Medics will typically only see hyperglycemia in patients with diabetes. Hyperglycemia is BG over 11.1 mmol/L (200 mg/dL), though symptoms may not present until 13.8 to 16.7 mmol/L (250 to 300 mg/dL). It may be caused by insufficient insulin or diabetic medication especially after eating. Hyperglycemia generally develops slowly. Patients who are ill are at higher risk of hyperglycemia in general, and it may develop within hours in ill patients.

Signs and Symptoms

Early symptoms of hyperglycemia include nausea, vomiting, increased thirst, and increased volume of urine output. The increased urine output creates a state of dehydration, and the patient may have flushed, dry skin. Patients may have headaches, blurred vision, or fatigue. They may have altered mental states and appear “drunken.” Symptoms of severe hyperglycemia include seizures, coma, and death.

Patients may have diabetic ketoacidosis (DKA) which presents with breath that has a fruity odor or smells of acetone.[iv] A sign of DKA is shallow, rapid breading. Severe DKA presents with deep, labored breathing (Kussmal respiration). This hyperventilation removes carbon dioxide from the blood which raises the pH to counter the acidosis. If you or the patient has urine ketone test strips, the patient may want to test themself.

Treatment

Hyperglycemic patients should be evacuated to advanced medical care in all cases.[98] Provide supportive care during evacuation including airway management and treatment for shock. If the patient is alert enough, give them fluids to help prevent dehydration. Do not administer insulin to the patient,[98] but if the patient is alert and oriented, allow them to self administer. Like with hypoglycemia, if the patient has an insulin pump, do not attempt to remove or disable it.[80]

[iv] For reference, acetone is the primary ingredient in nail polish remover.

If you cannot differentiate between a patient who is hypoglycemic or hyperglycemic, you may still administer glucose as extra glucose will not harm hyperglycemic patients.

Summary

Blood glucose related disorders may be most often found in patients with diabetes. Hypoglycemia may result from excess insulin or insufficient food consumption, treatment is giving the patient glucose and possible evacuation. Hyperglycemia may result from insufficient insulin in diabetic patients, and treatment is preventing dehydration and evacuation. When the two cannot be differentiated, glucose should be administered.

26 : Drug Overdoses

Tune in, turn on, drop out.

Timothy Leary

Psychoactive drugs are found in many anarchist spaces and within left-wing social movements. They range from the mild like caffeine and nicotine to the “harder” drugs like heroin or methamphetamines. Use of psychoactives can be relaxing, exciting, and in some cases even mind expanding. This chapter is not about when drug use goes right but rather when it goes wrong.

Use of psychoactives (beyond coffee and cigarettes) occurs during many actions, though as actions tend more militant, their presence generally drops. Medics will most likely encounter users at demonstrations and especially when actions are more fun and celebratory. They will rarely, if ever, encounter intentional overdoses during actions. Most overdoses will be accidental. Users of psychoactives may overdose due to changing tolerance, varying potency, or poor measurements of dosages. Interactions between different drugs may lead to overdose, and users may not always be getting the drug they intended. Regardless of how it happens, medics need to know how to treat an overdose.

Overdoses during actions may be difficult to find in a timely manner. Fascist and State violence is more predictable and happens in expected locations. Overdoses tend to happen at actions where there are larger crowds, music, and other loud entertainment. In order to find patients in the early stages of an overdose, it is recommended that medics patrol through crowds and more actively seek out patients.

An Overdose in the Shadows - Anonymous

We were helping out at an anti-gentrification action that had started in the early afternoon and ended up stretching late into the night. Thousands of students, neighbors, and all sorts of other people had marched through the streets crying out against rising rents and evictions. It was also a bit of a cultural celebration with music playing from speakers strapped to the roofs of vans.

The march has ended at a park and turned into a giant block party. People had been drinking and taking drugs the whole day, so we had our two teams walking around looking for people who were sick or passed out.

My team was walking around the poorly lit edges of the celebration when someone saw our reflective vests and flagged us down. She said her friend "wasn't doing so good." We followed her to her friend who was rolling around, twitching, and grunting at the base of a tree. I recognized him by his outfit as someone who has been partying all day.

Our initial examination showed that he had an elevated heart rate (132 BPM), decreased oxygen saturation (87%), and dilated pupils that did not react to light. The patient's friend didn't know what he had taken, so we guessed it was an MDMA overdose. That didn't really matter because all we could do was call EMS. While we waited, we moved the patient off the tree's roots and on to the grass and wrapped him in an emergency blanket. EMS arrived, we gave them our findings, and they took the patient to a hospital.

We don't know what happened to the patient, but we felt lucky that we were dressed as obvious medics that day and decided to walk through the quiet parts of the park.

Serotonin Syndrome

Serotonin is a neurotransmitter that has many effects on the body, though it is commonly associated with simply being a happiness chemical. Serotonin affects mood, appetite, pain, anxiety, and sleep among other functions.

A serotonergic drug is any drug that affects serotonin such as serotonin agonists and antagonists, serotonin reuptake inhibitors, and serotonin releasing agents. Serotonergic drugs include antidepressants like MAOIs, SSRIs, SNRIs, and cyclic antidepressants; recreational drugs like amphetamines, cocaine, fentanyl, LSD, and mescaline; and other drugs like St. John's Wort, tramadol, and lithium.

Serotonin syndrome is a group of symptoms that appear in reaction to taking serotonergic drugs. It may occur in as a result of a single drug such in which case it often occurs after increasing the dosage of antidepressants. In the context of overdose and recreational drug use, it typically occurs as a result of an overly large dose or the concomitant use of multiple serotonergic drugs.

Signs and Symptoms

Serotonin syndrome is characterized by cognitive, autonomic, and neuromuscular effects. Symptoms may include restlessness, anxiety, altered level of consciousness, agitation, perspiration, hyperthermia, tachycardia, tachypnea, pupil dilation (mydriasis), muscle rigidity, loss of coordination, hyperreflexia, tremors, and myoclonus (brief, involuntary spasms in a muscle group). The most common symptoms are altered mental status, hyperthermia, muscle rigidity, and myoclonus.[80]

A diagnosis of serotonin syndrome requires the exclusion of other medical and psychiatric conditions,[80] so a conclusive diagnosis and treatment is outside the scope of a riot medic's knowledge. Medics should be aware of this syndrome to strengthen recommendations for advanced medical care for patients whose recent history and symptoms suggest they have serotonin syndrome.

Treatment

Serotonin syndrome can be mitigated by ceasing taking the serotonergic drugs, however it can be dangerous to recommend that patients stop taking prescription medication. All patients should be evacuated to advanced medical care to for additional treatment and monitoring. In mild cases, the patient may not consent to evacuation. If the patient is taking prescription serotonergic drugs, they should be directed to promptly contact their physician or psychiatrist to discuss their medication.

General Treatment for Overdoses

The following general treatment principles will help with all cases of intoxication or overdose. These are more conservative measures meant to ensure patient health. In most settings where drugs are being consumed, most people don't want to make a fuss and involve medical professionals. They often want to wait it out to see if any problems resolve themselves on their own to avoid "killing the mood." As a medic, if you're involved, there is a good chance it is more serious. Regardless, it is better to error on the side of caution.

Deescalate and protect yourself. Patients may be fearful, paranoid, aggressive, or combative. You may need to deescalate the situation to protect yourself and bystanders. Deescalation also minimizes the chances of police involvement. Personal safety needs to be prioritized over treatment and deescalation. If the patient hurts you, you cannot help them.

Determine drugs consumed. As part of the patient assessment, you will have asked what medications they have taken. Knowing what they took, how they took it, and when they took it can help you and advanced medical care guide treatment. Ask them about what other drugs they took concomitantly. If the patient is unreliable or unresponsive, you or your buddy should ask these questions to friends and bystanders. However, do not prioritize the interview over treatment of the patient. People may be unwilling to answer questions out of fear that you will inform on them to the police. You may need to assert that you will not do this and that patient confidentiality would legally prevent you from doing so.[i]

Avoid food and drink. If a patient cannot eat or drink on their own, do not give them food or drink. During your treatment, if the patient appears to be recovering, consider letting them eat or drink a small amount on their own. If the patient's condition worsens, additional stomach contents may contribute to aspiration. However, if your differential diagnosis cannot rule out hypoglycemia, consider administering a small amount of sugar.

Do not induce vomiting. Inducing vomiting can lead to aspiration and may not have any effect on the amount of drugs absorbed by the body.

Place patient in rescue position. If the patient has a reduced level of consciousness but is still breathing, place them in the rescue position to minimize the chances of aspiration until they recover or advanced medical care arrives. Continuously monitor their ABCs.

Call advanced medical care. At an action, you may not be able to spend hours with a patient to monitor their condition. If the patient is not verbally responsive, call emergency medical services.

Calm bystanders. Drug overdose may cause panic in the patient's friends and bystanders. This panic may be made worse because they may not be sober either. Speaking words of reassurance in a calm voice generally is sufficient to reduce panic. Avoid saying things like "they will be fine" and "everything is ok" because such phrases may not be true. Use phrases like "I'm here to help" and "I'm trained for this."

Keep bystanders away from the police. If EMS is called, police may also arrive either before or after EMS. Bystanders who are panicked may want to talk as a way to relieve stress. They may incriminate themselves, the patient, or others. Explain this risk to bystanders after you have called EMS, and assign a free medic or the most sober volunteer to act as caretaker who keeps people from talking to the police.

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[i] You may need to check the laws in your region to determine if this protection exists.

Common Drug Overdoses

Patients may overdose on common drugs like paracetamol or nicotine, but these are less likely to be encountered by riot medics. This section covers only common recreational drugs.

Alcohol Overdoses

Alcohol[ii] is a psychoactive drug generally consumed for its euphoric effects, to increase sociability, or to blunt feelings. Alcohol is a CNS depressant. Blood alcohol levels peak approximately 30 to 60 minutes after ingestion, and absorption is delayed by the presence of food in the stomach.[80] Mental impairments begin at relatively low doses and progress from decreased ability to concentrate to decreased respiratory rate and heart rate.

Tolerance to a given amount of alcohol varies by weight and gender due to different ratios of fat and water in the body. Women of the same weight as men will on the average become more intoxicated when consuming given amount of alcohol. There is individual variation on tolerance to alcohol, and thus symptoms may vary by individual. Tolerance can be developed by consuming alcohol leading to less effects for the same blood alcohol content (BAC). Years of heavy drinking can lead to reduced tolerance as the liver becomes scarred and cannot metabolize alcohol.

Signs and Symptoms

Mild[iii] alcohol intoxication presents with euphoria, increased sociability, impaired judgement, difficulty concentrating, reduced fine motor control, and flushed skin. Moderate intoxication presents with delayed reactions, impaired senses, confusion, analgesia, ataxia, dizziness, and vomiting. Severe intoxication (often called alcohol poisoning) presents with severe ataxia, periods of unconsciousness, anterograde amnesia (“blacking out”), vomiting, decreased respiratory rate, decreased heart rate, pupils that do not respond to light, and coma. Because alcohol is a vasodilator, severely intoxicated patients may have hypotension or be hypothermic.

[ii] An alcohol is member of a general class of organic compounds. In colloquial terms, it is synonymous with ethanol. In this chapter (and the rest of this book), the term alcohol means ethanol unless otherwise specified.

Patients may also be hypoglycemic which itself presents similar to drunkenness. Death from alcohol can be caused by the aspiration of vomit, hypoventilation, or alcohol contributing to an overdose by other drugs.

Specific Treatment

There is nothing that can be done by medics to reverse alcohol intoxication. Their task is to determine if the patient is sufficiently intoxicated to require advanced medical care, and if not, to monitor the patient and provide basic care. Alcohol can lead to overdoses with cocaine, barbiturates, benzodiazepines, and opioids among others. The patient and bystanders should be interviewed to determine if there is any risk due to concomitant drug use.

Treatment for severe alcohol intoxication by the general public is often to let the patient "sleep it off," which is to say no treatment is given. Urban legends say that getting the patient to eat something, drink water, or drink coffee will help reduce intoxication. This may make the patient feel better, but it does not reduce BAC.

Opioid Overdoses

Opioids[iv] are natural and synthetic substances that are primarily used for pain relief and anaesthesia. Common opioids are opium, morphine, codeine, hydrocodone (sold mixed with either paracetamol [Vicodin] or ibuprofen [Vicoprofen]), oxycodone (OxyContin), heroine, fentanyl, and methadone. Opioids are used recreationally for their euphoric effects and may be administered by injection, smoking, insufflation (snorting), or oral consumption. Their effects peak about 30 to 60 minutes after consumption when taken orally (90 minutes for controlled release tablets) whereas the effects peak near immediately with other methods. Opioids' effects can last between 1 to 6 hours depending on the opioid used.

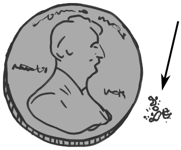
Tolerance for opiates develops with their repeated use. Non-standard strength and quality of opiates can lead to poor estimation of dosage resulting in overdose. For most users, a lethal dose of heroin can be as low as 75 mg. A lethal dose for fentanyl for most humans is 2 mg (Figure 26.1).

[iii] The terms mild, moderate, and severe and not medically precise descriptors of intoxication and are being used in place of BAC. Medics cannot easily measure BAC, and estimation formulas are not worth memorizing as treatment is based on symptoms and not BAC alone. Mild, moderate, and severe intoxication are roughly equivalent to the colloquial terms tipsy, drunk, and shitfaced.

[iv] The term opiate is used to describe substances derived from opium. Opioid is a more modern term that describes all substances that act on opioid receptors.

Taking opioids concomitant with benzodiazepines and alcohol increases the chance of overdose.

Figure 26.1: Lethal Dose of Fentanyl[9]



Signs and Symptoms

Effects of opioid use include euphoria, reduction in anxiety, drowsiness, disorientation, delirium, nausea, analgesia, muscle weakness, muscle spasms, seizures, flush and warm skin, miosis (pupil constriction), hypotension, bradycardia, and hypoventilation.

Specific Treatment

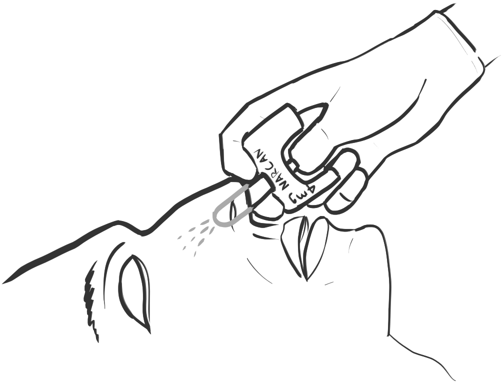
Naloxone is a treatment option that may be available in your region that requires neither a prescription nor a medical license. Naloxone works by binding to opioid receptors with higher affinity than opioids but without activating the receptors. Naloxone can be administered nasally (Narcan) or intramuscularly (Evzio) and reverses overdose within 2 to 3 minutes. If overdose symptoms show minimal or no improvement, naloxone can be re-administered in 2 mg doses every 2 to 3 minutes up to a maximum of 10 mg until symptoms improve. If available, medics should use a naloxone nasal spray over an autoinjector. Nasal sprays can be used multiple times on a single patient, and the devices are smaller.

Administering Narcan. Instructions for administering Narcan are listed below for educational purposes. If you carry naloxone, you should follow your device's specific instructions.

Narcan is a nasal spray that delivers pre-measured 4 mg doses of naloxone (Figure 26.2). Remove the device from its packaging, place it in the patient's nose, and fully depress the plunger. Only 50% of the dose is absorbed through the nasal mucosa, so 5 total doses may be administered.

Watch for signs of withdrawal. Use of naloxone may cause the patient to rapidly go into opioid withdrawal. Symptoms may include irritability, agitation, muscle pain, sweating, shakiness, opioid cravings, tachycardia, and elevated blood pressure.

Figure 26.2: Narcan Administration[9]



Beware of agiatation. Patients who have taken stimulants concomitant with opioids may have the stimulants' effects dampened by the opioids. Treatment with naloxone will reverse the effects of the opioids but not the masked stimulants. This may lead to a suddenly very alert and active patient who only has signs of stimulant intoxication.

Consider evacuation. For patients who overdose on opioids and are treated with naloxone, it is strongly recommended that they are evacuated to advanced medical care. The effects of naloxone last 30 to 60 minutes but can be as short 20 minutes if the patient has taken large amounts of opioids.[80] A medic may use discretion and choose not to evacuate to advanced medical care if the patient shows significant improvement and if the medic is able to spend hours with the patient to monitor for overdose relapse and to re-administer naloxone.

Naloxone urban legends. Some urban legends say that naloxone does not work on fentanyl overdoses. This seems to stem from poorly worded headlines and misunderstood articles that were trying to convey that the strength of fentanyl means that it requires additional naloxone to be effective. Naloxone can be used to reverse fentanyl overdoses.[182,183]

Sedative-Hypnotic Overdoses

Sedatives are substances that have a calming effect, and hypnotics are substances that induce sleep. Collectively they are known as sedative-hypnotics because of their significant overlap. Colloquially they are known as "downers." Opioids fall into the sedative-hypnotic category, but they were discussed separately because of the possibility of using naloxone to treat opioid overdose. Alcohol is also classified as a sedative-hypnotic. Concomitant use of sedative-hypnotics can have dangerous interactions leading to death via respiratory depression.

Other classes of sedative-hypnotics include barbiturates, benzodiazepines ("benzos"), general anaesthetics, and antidepressants. Common sedative-hypnotics are found in Table 26.1.

Table 26.1: Common Sedative-Hypnotics

Name	**Description**
Phenobarbital	A barbiturate; medically used as an anticonvulsant and sleep aid; recreationally used as a euphoric sedative
Diazepam (Valium)	A benzodiazepine used to treat anxiety, muscle spasms, and difficulty sleeping
GHB	Medically used as a general anaesthetic; used as a recreational drug with euphoric and ethanol-like effects; used as a date rape drug to induce unconsciousness and memory loss
Ketamine	Medically used as an anaesthetic and to treat depression; recreationally used to induce hallucinations and a dissociative state

Signs and Symptoms

General shared signs and symptoms across many sedative-hypnotics include euphoria, calmness, loss of coordination, slurred speech, muscle weakness, difficulty concentrating, hypotension, hypoventilation, bradycardia, and loss of consciousness.

Specific Treatment

Treatment for sedative-hypnotics is airway management and evacuation to advanced medical care. Naloxone is safe to use on anyone as it has minimal side effects, including those experiencing no overdose at all. Thus, it is not important to differentiate sedative-hypnotics from opioids in order to treat patients. Patients who display signs of opioid overdose can be treated with naloxone with no ill effects.

Stimulant Overdoses

Stimulant is a broad classification of drugs that increase CNS activity or are found to be invigorating. Colloquially they are known as "uppers." Common stimulants are nicotine and caffeine. Medical use of stimulants includes treatment for sleep disorders, mood disorders, and impulse control disorders.

Recreational stimulants include methamphetamine, MDMA (ecstasy, molly), and cocaine. Stimulants are often taken to increase motivation and propensity for activity, for their euphoric effects, and to induce insomnia. All of these effects can be used to increase the user's ability to continue partying. Stimulants are sometimes taken concomitantly with sedative-hypnotics to counter the latter's sedating effects.

Peak action when insufflating cocaine is 20 to 30 minutes after use with effects lasting 1 to 2 hours. Effects peak at 3 to 5 minutes when smoked and the effects last about 30 to 60 minutes. Peak action when insufflating methamphetamine is 1 to 2 hours and 5 to 10 minutes when smoked. Effects of methamphetamine last 8 to 12 hours.

Concomitant use of cocaine with alcohol leads to the metabolization of cocaethylene in the liver. Cocaethylene is similar to cocaine, but increases the risk of sudden death by 18 to 25 times compared to cocaine.[184]

MDMA is a serotonergic drug. Concomitant use while a patient is taking MAOIs, SSRIs, or other antidepressants can lead to serotonin syndrome. Individuals taking MAOIs or SSRIs are strong advised against taking MDMA.

Signs and Symptoms

Effects of stimulants may include feelings of happiness, elevated energy levels, agitation, paranoia, the feeling of bugs on or under the skin (formication), sweating, dilated pupils, tachycardia, hypertension, and hyperthermia. Sweating can lead to dehydration, and replenishing lost water without replenishing salts can lead to low blood sodium concentration (hyponatremia).

Users of amphetamines, in particular methamphetamine, may experience psychosis at high doses. This may present as paranoia, a feeling of persecution, anxiety, delusions, and hallucinations.

Cocaine use causes vasoconstriction of the coronary arteries which can lead to acute coronary syndrome (ACS).[80] The main symptom of ACS is chest pain or tightness. The patient may be sweating, have heart palpations, or have nausea. Risk of ACS while using cocaine is increased by smoking cigarettes, and its risk is highest in smokers who regularly use cocaine. For more information on ACS, see Chapter 23 ("Respiratory and Cardiac Emergencies").

Specific Treatment

Patients who display signs of ACS or serotonin syndrome should be evacuated to advanced medical care. Patients who are hyperthermic should be cooled using fanning and water mist. More complete cooling techniques are discussed in Chapter 22 (“Heat Illness”). Treatment may be complicated by drug-induced psychosis. Even with reassurance, patients may not consent to aid, and attempting to render aid may be dangerous for medics.

Hallucinogen Overdoses

Hallucinogens are drugs that cause hallucinations, altered perceptions, and changes in thoughts and consciousness. As a category, hallucinogens are not distinct. For example, MDMA is both a stimulant and a hallucinogen, and ketamine is both a sedative-hypnotic and a hallucinogen. Use of hallucinogens is associated with the hippie culture and psychedelia of the 1960’s as well as psychonautics,[v] though their use goes back into ancient human history where they have been used in shamanic and spiritual ceremonies. Common hallucinogens are cannabis (marijuana, weed), LSD (acid), psilocybin (mushrooms), DMT, and substituted phenethylamines (such as 2C-B and mescaline).

Hallucinogens can be smoked, ingested either through baked goods or teas, insufflated, or (less commonly) injected. The duration and intensity of hallucinations and altered mental state depends on the drug, amount, and method of consumption. Effects of LSD last for 8 to 12 hours and mescaline for 8 to 14. Effects of snorting ketamine last 30 to 45 minutes and smoking DMT last for 5 to 20 minutes.

Signs and Symptoms

Typical physical symptoms for hallucinogens include nausea, mydriasis, dry mouth (xerostomia), hyperthermia, hypothermia, sweating, tachycardia, and (rarely) seizures. Mental changes include detachment from reality, visual and auditory hallucinations, delusions, and what may appear to be confusion and a lack of focus. Generally symptoms are most easily recognized as mydriasis and altered mental state.

A bad trip (drug-induced temporary psychosis) is an unpleasant or terrifying experience while using psychoactive drugs and in particular hallucinogens. Bad trips may be brought on by the user’s mood, the setting, or an excessive dose. Symptoms include fear, anxiety, panic, delusions, a feeling of being trapped, and ego death. As part of panic, individuals may become erratic and hyperventilate.

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[v] From Greek *psychē* (“spirit/mind”) + *naútēs* (“sailor/navigator”), meaning “sailor of the soul.”[185]

Specific Treatment
The only treatment may be the mitigation of a bad trip by making the patient feel calm and comfortable. The “bad” part of a trip may be short lived, and calming the patient may allow them to continue on with their trip after treatment. This may be a long process as communication with the patient may be difficult. Patients may be agoraphobic or claustrophobic, frightened, and untrusting of those who try to help them. Generally, move the patient to somewhere with less stimulation away from loud noises and bright lights. Patients with detachment from reality may find comfort by being instructed to focus on an object that they can identify as permanent. Consider giving the patient a patient a leaf, flower, shell, ball, or other small object they can hold in their hand and instruct them to focus on it whenever they are unsure what is real or not or whether they are alive or not.

Summary

Medics’ main focus on treating overdose is to calm patients and bystanders and determine if patients need advanced medical care either for physiological symptoms or drug induced psychosis. Individual symptoms such as respiratory arrest or hyperthermia can be managed while waiting for evacuation. Treatment in the field for bad trips and mild overdoses is often palliative and supportive until the effects naturally wear off. Medics may be able to reverse opioid overdose with naloxone, but more generally they will not be able to render care for severe overdoses of other drugs. Like when treating all patients, but especially when treating intoxicated patients, a sense of calm from the medics will help ease patients and reduce anxiety.

27 : Unresponsive States

> Because a government won't grant us all freedom / The rich won't give back the land / The only true freedom is freedom for all / Each life guided by its own hand
>
> Dawn Ray'd, *Black Cloth*[186]

During actions, individuals may become unresponsive for a variety of reasons. This chapter covers unresponsive states that aren't associated with other illness and injuries covered by the previous chapters.

Seizures

A seizure is a period of disruption to normal brain function caused by a sudden surge of inappropriate electrical activity in the brain. Not all seizures are epileptic as seizures have diverse causes. Epilepsy is a condition where a patient has recurrent epileptic seizures.

A primary (idiopathic) seizure is one with no identifiable cause. A secondary (symptomatic) seizure is one with an identifiable neurological cause such as a previous traumatic brain injury or stroke. A reactive seizure is one with causes such as trauma, electrical stimulation, and metabolic disturbances in individuals without epilepsy. Reactive seizures are self correcting and are not classified as epileptic seizures.[80]

Causes of seizure include hypoglycemia, traumatic brain injury, heat stroke, use of recreational drugs, sleep deprivation, and some types of insect stings. Stress and flashing lights can cause seizures in individuals with epilepsy. Despite taking anticonvulsants, individuals with epilepsy may also have breakthrough seizures. These can be more dangerous as they may be more unexpected.

Signs and Symptoms

Signs and symptoms depend on the type of seizure a patient experiences.

Partial seizure. Partial (focal) seizures are caused by electrical activity in one part of the brain, and they may spread to other parts or the whole brain. Signs and symptoms include repetitive behavior (automatism) such as simple gesturing, fiddling, lip smacking, or repetitive speech or incoherent vocalizations; sensory hallucinations; significant changes in mood including paranoia, depression, and ecstasy; and distorted memory or perception. The patient remains conscious and may be able to continue whatever activities they were engaged in, and they may have amnesia and not remember the seizure. The sensory hallucinations are known as auras and may precede generalized seizures.

Generalized seizure. Generalized seizures are suspected to caused by simultaneous electrical activity in the entire cerebral cortex.

A generalized tonic-clonic seizure (grand mal) is what most most people think of when they think of a seizure. During the tonic phase, the patient becomes rigid and falls to the ground. This phase subsides and the patient's movements go from coarse to smaller, rhythmic (clonic) trembling. Patients may urinate or vomit, and they may be apneic leading to hypoxia which can lead to cyanosis. Typically an attack lasts 60 to 90 seconds followed by rapid, deep breathing and unconsciousness. The patient's consciousness gradually returns and is followed by a state of fatigue and confusion that may last for hours.

An absence seizure (petit mal) is a brief seizure lasting only several seconds. The patient develops an altered state of consciousness giving the perception that they are confused or withdrawn. They may retain normal posture or have some amount of slumping or jerking. Their current activity ceases (e.g., they stop walking or talking), and their eyes may start twitching. They may urinate, and they may not respond to voice or touch stimuli. The seizure ends abruptly and the patient will continue with their activity without realizing anything has happened. Observers may describe an absence seizure as "spacing out" if they are unfamiliar with the symptoms.

Status epilepticus. Status epilepticus is a generalized seizure lasting for 5 or more minutes or two consecutive seizures without regaining consciousness.

Treatment

You cannot stop a seizure that is in progress, but you can prevent secondary injury.

Protect the patient. Move objects away from the patient to prevent injury. If the patient's movements are not violent, you may be able to hold their head to prevent it from hitting the ground. If this is not possible, position bulky clothing under the patient's head.

Protect yourself. Do not attempt to restrain the patient as they may injury you. A patient will protect their own airway, so do not risk injury by placing your fingers in their mouth. Further, use of an adjunct may damage their teeth.

Consider use of the rescue position. If the patient's seizure allows it, place the patient in the rescue position to prevent aspiration of saliva or blood. You may need to gently hold the patient on their side.

Open the airway. After the seizure has subsided, open the patients airway and check for obstructions. Return the patient to the rescue position until they regain consciousness.

Consider evacuation. If the patient has a reactive seizure or status epilepticus, they need to be evacuated to advanced medical care. Otherwise, the patient should be evacuated with a buddy and directed to see a physician for evaluation when they are able. Patients who have had a seizure are at risk for having a second, and they may remain dazed or confused for hours. It is not safe for them to stay at an action even if they think that they are fine.

Unknown Unresponsive States

Determining the cause of a patient's unresponsiveness during an action can be challenging. From context or information from the patient's friends or other observers, you may be able to deduce what has happened to guide treatment. Treatment should always begin with checking the ABCs. If there is not a clear mechanism of injury, it is safe to treat for hypoglycemia as described in Chapter 25 ("Blood Glucose Disorders") as this will not cause problems for other illnesses or injuries.[98]

Summary

Unresponsive states may be identifiable as having known origins such as hypoglycemia or trauma, or they may be epileptic seizures. Protect the patient's airway and attempt to identify the underlying cause. Patients who become unresponsive should be evacuated. If you cannot identify the cause, or if you are unsure whether the evacuation should only be sending the patient home, the patient should be evacuated to advanced medical care.

Part III

Equipment

28 : Medical Supplies

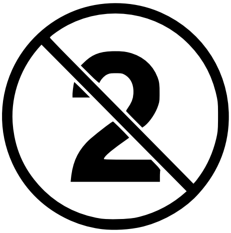
> To be successful in building a new social-ecological society we have to conceive of the human being as a life form that, with its creativity and creative power, can make a great contribution to the improvement of the entire natural world.
>
> *Make Rojava Green Again*[187]

In order to remove ambiguity around the equipment mentioned in other parts of this book, all equipment has been included here. This chapter also provides a place for considerations and more in depth discussions of each item. The following is not a mandatory list of supplies, but suggestions for things medics will find useful. A discussion on packing your bag can be found in Chapter 31 ("Packing Your Bag"). If you already work professionally in the medical field, you will likely want to supplement the following items with more specialized tools that you are qualified to use.

Some medical equipment that appears to be reusable is actually single-use. Look for the presence of the single-use logo on equipment (Figure 28.1). Reusable equipment is manufactured differently and is often more expensive, and equipment that is single-use may not be able to be properly sterilized after use and should therefore be discarded. Since you likely do not have the ability to sufficiently sterilize equipment, and since you may never even end up using such equipment, it is better to acquire the single-use versions.

Additionally, many consumable items such as gloves, gauze, and other dressings come in sterile and clean (non-sterile) varieties. Sterile items are generally significantly more expensive than their clean counterparts. Studies show that using clean consumables for treating patients in hospitals and at home is acceptable as it does not lead to significant increases in rates of infection.[188–191] If you are purchasing your own equipment, especially if doing so at retail prices, acquiring clean consumables can significantly reduce costs.

Figure 28.1: Single-Use Logo



Infection Control

The following items are used for infection control and body substance isolation (BSI). They will help protect spreading disease between you and the patient.

Examination Gloves

The only item that should be considered mandatory are nitrile examination gloves. Examination gloves are the most important tool for BSI. They help prevent the transmission of diseases between medic and patient. Changing gloves after treating a patient helps prevent transmitting disease or chemical agents to the next patient. Nitrile examination gloves are preferred to latex gloves because some people may have a latex allergy. Vinyl is an acceptable alternative to nitrile.

It is useful to be pre-pair gloves by rolling them into each other as one does when pairing socks. This makes it easy to quickly grab a pair from a pocket to put on or to hand out.

White or classic blue examination gloves are recommended as they make it easy to see blood and other fluids while examining a patient. These colors may also be a visual aid to help others identify you as a medic. Holding up your hands while wearing blue gloves may allow you to move more freely and to approach patients during conflicts[i] or while others are being arrested.[ii] Conversely, black gloves are not recommended as it is hard to see blood on them.

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[i] This only really applies when police are still attempting to maintain some pretense of respectability or restraint. It also tends to work better when the police have more active problems to deal with and they view medics as “not an active threat.”

[ii] It is not recommended to attempt to render aid to someone who is being arrested as police do not respond well to interacting with someone who is in their custody. You may be arrested for interfering with police operations.

Hand Sanitizer

Hand sanitizer is a liquid that can be applied to the hands to decrease the amount of infectious agents. It is available as liquid, gel, or foam. Your hand sanitizer should be alcohol based and contain at least 70% alcohol for effective sanitization. You should use hand sanitizer before and after touching a patient.

Eye Protection

If you do not carry the kind of eye protection used to protect your eyes from riot control agents or projectiles, you should at least carry eye protection to protect you from patients' bodily fluids. While hemorrhaging, patients may spurt blood. During treatment of unresponsive patients, they may vomit. Safety glasses, the kind used for construction, are a good choice. The kind of lightweight, disposable eye protection used in doctors' or dentists' offices tend to be too flimsy for protest environments.

Surgical Masks

A surgical mask is a lightweight facial mask used to prevent transferring bodily fluids to and from your nose and mouth. They are not effective against riot control agents. They may also be used to cover a patient's face during evacuation to help protect their identity.

Protective Blue Gloves[iii] - Anonymous

One weekend we were out in service of a large mobilization against a far right group marching in our city. A group of the radicals hopped on the metro and took it a few stations to hopefully get past the police presence. We were unimpeded when we came out, so the group took off running down a side street. Preemptively, I put my examination gloves on to be able to help injured comrades more quickly and also to signal that I was a medic since I was wearing all black.

Maybe 5 to 8 riot cops were there with no back up, and the group was easily able to break through with minimal injuries from the State. I was positioned at about the third line and was able to see several protested get pepper sprayed and a couple take police batons to the head and legs as they ran past.

One went to the ground and started screaming while clutching their leg. I started running towards them when a riot cop turned around and raised their baton as if to strike the injured comrade. I screamed "Medic! Medic!" with my hands held out. The cop stopped and lowered their baton to go find someone else to hit, probably because they figured it would look bad if they were hitting a medic who was trying to help an injured person.

I was lucky the cop didn't hit me, and I think having the blue gloves was a big reason for that. I may have saved that comrade from being arrested, and at the very least stopped them from being hit again.

Wound Management

They following items are used for minor and major wound management.

Gauze Pads

Gauze pads are sheets of woven fabric used to stem the flow of blood; dress wounds; and clean patients of blood, dirt, other bodily fluids, and chemical agents. Gauze pads can be acquired in individual or bulk packages. Individual packages typically have 5 sheets of gauze, and bulk packages typically have 100 sheets. Bulk packages are cheaper, but individual packages will stay cleaner for longer.

The standard 10 cm × 10 cm size is appropriate for most use cases. You may want to additionally carry smaller sizes.

Dressings

Dressings are covering for wounds that can be used to stem bleeding, absorb wound secretions (exudate), or protect the wound from further damage or infection. Gauze is a common dressing.

Dressings may also be occlusive (such as a chest seal) or semi-occlusive. Semi-occlusive dressings to allow air to move across the barrier but keep out outside liquids. Dressings can also be non-adhesive. Gauze may stick to wounds which can painfully damage them when removed. Non-adhesive dressings do not stick as readily to wounds. Dressings may be coated with petrolatum (petroleum jelly) to help prevent adhesion to the skin. These can come in both occlusive and semi-occlusive varieties.

The goal of wound care is to keep wounds moist but not wet. For many small wounds, use of gauze is an acceptable dressing. For burns and larger wounds, non-adhesive dressings are recommended. Wounds that are still

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[iii] While I find this to be an interesting story, and while it matches some of my own experiences, medics should nevertheless be cautious against relying on police restraint.

bleeding should be treated with gauze and or other absorbent dressings. Wounds that may become dried out, such as burns and abrasions, should be treated with semi-occlusive dressings.

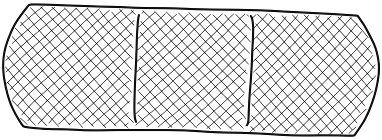
Gauze Rolls

Gauze rolls are similar to gauze pads, but usually have fewer layers, are narrower, and are much longer. They are primarily used to affix gauze pads on to a wound, apply constant pressure, and hold the edges of the dressing down to keep dirt out. Gauze rolls usually come in 5 cm × 1 m or 10 cm × 1 m. The 5 cm width is more versatile and should acquired before acquiring the larger size.

Adhesive Bandages

Adhesive bandages (Figure 28.2), also know as plasters or band-aids, are used to cover small wounds. Adhesive bandages should be waterproof and made of flexible textile-like material (as opposed to a plastic-like material). Plastic bandages do not stick to the skin as well, especially on joints during activity. Bandages should be acquired in neutral skin tones to help prevent the presence of bandages from identifying protesters. Various sizes and shapes should be carried, especially the varieties that are used on fingers as patients will likely be using their hands after they leave your care. Some larger types are specifically designed to be cut to that that may fit on joints or oddly shaped body parts.

Figure 28.2: Adhesive Bandage[12]



Sometimes the primary function of an adhesive bandage is not to cover and protect a wound, but to offer some sense of care and normalcy to the patient. A patient in a protest environment is likely to have them torn off through action, and most wounds that require a plaster are not serious enough to require any attention at all.[iv] The bandage is a totem symbolizing care and solidarity, and for this reason it may be worth carrying some. Some medics intentionally carry adhesive bandages with fun colors and designs to add levity to an otherwise serious situation.

[iv] That said, it is always good to use bandages to help prevent infection.

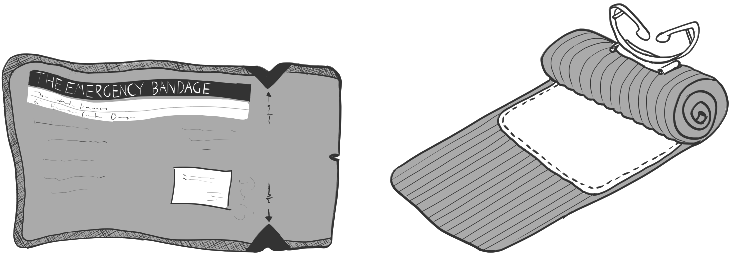
Roller Bandages

Roller bandages are a gauze pad, often non-adhesive, affixed to a gauze roll and used as an all-in-one dressing. They usually come in 5 cm and 10 cm widths. Like with gauze rolls, the 5 cm width is preferred for most use.

Combat Dressings

A combat dressing (Figure 28.3), sometimes called an emergency bandage or Israeli bandage, is similar to a roller bandage but with a hook used to create compression and a plastic closure bar used to easily secure the bandage. Combat dressings are used to quickly cover a wound and apply pressure so that the medic may move on to treat other patients. Their design allows the user to apply one to themselves using a single hand. These are not generally used by medics as the primary method of dressing a wound due to their cost and the fact that most injuries do not require such a large bandage. They are, however, convenient and useful, especially if action are expected to be riotous or face violent opposition.

Figure 28.3: Combat Dressing[9]



(a) Packaged (b) Unpackaged

Antiseptic Creme or Spray

An antiseptic is an agent that reduces infection by killing bacteria or inhibiting their growth. Antiseptics can be bought as a spray or a creme and used directly on a patient's wound after cleaning and before applying dressings. Sprays are advantageous as they can be sprayed over minor scraps and cuts when a patient does not want a dressing.

Some solutions used for irrigation can be applied to dressings as an antiseptic. Antiseptic wipes or solutions used to clean hands or prepare skin for injections should not be used on open wounds. Antiseptic cremes and sprays are also different from medicated cremes used to treat infection.

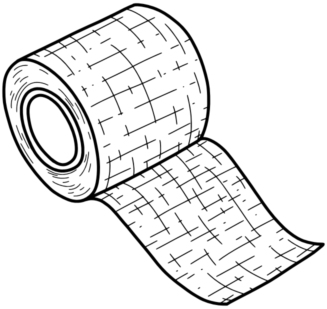
Elastic Net Dressings

An elastic net dressing is a tubular dressing used to hold a bandage in place. It adds no compression which can be useful for preventing constriction. It does not use adhesives so it can be used on patients with sensitive skin or who are allergic to tape. One of it's main uses for medics is to hold in place dressings on joints or head.

Self-Adhering Bandages

Self-adhering bandages (Figure 28.4), also known as cohesive bandages, are flexible, elastic bandages that adhere to themselves but not other things. These can be used to splint a broken finger or hold a dressing in place. They are usually available in 2 cm, 5 cm, and 10 cm widths. Bandages in the 2 cm size are best used on fingers and toes, and bandages in 5 cm work better for other extremities. Larger sizes are of limited utility. They usually come in white, blue, and other bright colors. Patients may not want to have bright markers on them, especially if they are part of the Black Bloc. Veterinary self-adhering bandages seems to be more readily available in black.

Figure 28.4: Self-Adhering Bandage[12]



Medical Tape

Medical tape, also known as surgical tape, is adhesive tape that is often made from cloth and is used to hold dressings in place. Medical tape comes in various widths, but for most injuries you encounter, 2.5 cm or 5 cm will be sufficient. Medical tape can be used to hold cuts together in place of wound closure strips or can be used to improvise bandages for fingers or joints along with gauze pads.

Wound Closure Strips

Wound closure strips are thin strips of porous medical tape used to hold minor wounds closed. They are often known by their brand name Steri-Strip. Wound closure strips are similar in function to butterfly bandages, a difference being that they are larger and are adhesive along their entire length. Carrying these is advisable as some patients will refuse secondary care out of fear of arrest, so irrigating and closing a wound may be the only treatment they will receive. Use of wound closure strips will help reduce scarring, but sutures applied by a physician are still preferable.

Wound closure strips generally come in two varieties. The first look like short and thin strips of tape. The second are two pieces of plastic or bandage that are pulled together by locking plastic strips. This are more difficult to use than the classic wound closure strips, so the are slightly less preferred for medics.

Hemostatic Agent

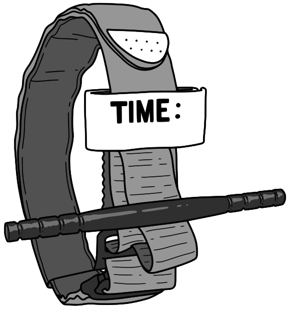
Artificial hemostatic agents, called antihemorrhagics, come in several forms, but the primary kinds used in emergency medicine are packages of hemostatic powder or granules and hemostatic treated gauze. Hemostatic gauze is easier to use because it can be packed into a wound while powder or granules may be forced out by blood flow. If medics choose to acquire granule hemostatic agents, they should look for devices that include a large gauge syringe for injecting them into the wound. This is superior delivery mechanism than dumping the granules atop the wound or trying to pack them in with gauze. Medics should also avoid acquiring the kinds of hemostatic sponges and sticks that are used for surgery.

Medics who expect to see gunshot wounds may want to consider looking at large gauge syringes that inject expandable hemostatic sponges (instead of granules) directly into wounds, such as the name brand XStat. However, such devices do not seem to be available to consumers at the time this book was written.

Tourniquet

A tourniquet (Figure 28.5) is a device that applies external compression to stop arterial blood flow. Tourniquets are used to prevent exsanguination until a patient can be taken to advanced medical care. Tourniquets come in many designs, but the most common is a fabric strap with a rope and windlass (stick) that are used to tighten the strap. Some tourniquets come with a white tab marked “Time” so that the medic may note the time a tourniquet was applied. If possible, tourniquets with these tabs should be acquired. Tourniquets with wider straps will be less painful on patients, so if possible, these should be acquired.

Figure 28.5: Tourniquet[12]



Some medics have used 3D printed tourniquets, and you may find success with them. However, they should be extensively tested before deployment to understand their failure modes.[v]

Saline

Saline, sometimes called saline solution, is a mixture of sodium chloride (NaCl) and water. Saline is 0.90% NaCl w/v, or 9 grams of sodium chloride per liter of solution. Saline is used to irrigate wounds, to flush the eyes, and as a mouth rinse.

Saline is sold for use with contact lenses. Acquiring these bottles is convenient because they are clean, malleable, and have an opening that is useful for irrigating wounds. All that is needed it to slightly widen the spray hole with an awl.

Saline Vials

Saline vials (Figure 28.6) are small, disposable vials of saline with twist-off tops. They can be used for irrigation of small wounds and rinsing the eyes. Saline is less painful for they eyes than water because it is isotonic.

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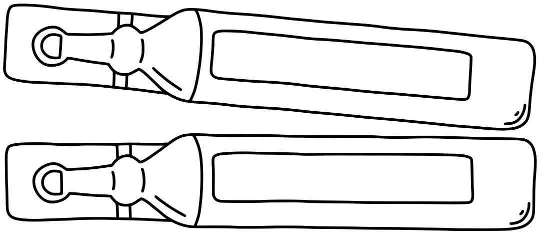
[v] Medical support in Gaza constructed 3D printed tourniquets as a means of reducing the cost of tourniquets as well as acquiring them despite Israel’s blockade. However, they had some design flaws.[192,193] Failures the medics observed were buckle failure and internal belt failure caused by sharp edges on the windlass. Both components were 3D printed.

Figure 28.6: Saline Vials[12]



Saline vials should be acquired in 20 to 50 mL doses.[vi] Under 20 mL is too small for rinsing the eyes of tear gas, and larger than 50 mL would likely warrant decontamination with an eyewash bottle. These can be handed out to allow individuals to decontaminate their own eyes or their comrades' eyes from tear gas if you are busy.

Irrigation

Irrigation requires a bottle or syringe and the solution used for irrigation.

Irrigation Solution

Irrigation solution is an solution used to irrigate wounds. Use of water or saline is acceptable for irrigation,[190] but antiseptic options are preferred.

Acquiring prepared irrigation solutions is advantageous because they come in bottles that are meant to be used directly on wounds. Examples of name brands are Octenisept and Prontosan. If you prepare your own povidone-iodine solution, filling contact solution bottles provides a good form factor for irrigating wounds. One-percent Povidone-iodine is often used in the wilderness because it can be acquired in a concentrated form and diluted for use. To mix it, add one part 10% povidone-iodine to ten parts water.

Irrigation Syringes

An irrigation syringe is a disposable plastic syringe, usually between 20 and 60 mL, that is used for cleaning wounds. Syringes can be acquired as part of a kit so that you have a reservoir for solution to prevent cross-contamination. Some syringes come with a guard to prevent droplets of blood or other body substances from splashing on to you, though this is not required so long as medics have appropriate eye and mouth protection.

[vi] I find that over 30 mL tends to be too large, but it's certainly not *wrong* to go larger.

If you do not have syringes, you can use your bottle of irrigation solution. Bottles should not be reused because bodily fluids can splattered back up on to the bottle. The exception is when bottles are simply used to rinse or shower a wound and there is no chance of splatter.

Burn Dressings

Burn dressings are dressings that are used to treat burns. They are non-adhesive and are designed to keep the wound moist. Some burn dressings may be semi-occlusive, and others may come soaked in a gel. You may consider purchasing burn gel to use with a normal dressing.

Some types of solutions used for disinfecting wounds can be used to treat burns. Apply the solution to gauze, and then apply it directly to the wound.

Chest Seals

A chest seal is a occlusive dressing designed to create an airtight seal on the chest. They are used primarily to manage pneumothoraces. Chest seals may come as individual seals or as a pairs in order to treat both the entry and exit gunshot wounds. Chest seals may come with a one-way valve, also known as a vented chest seal, to allow built up air and fluid to escape. Vented chest seals are used instead of non-vented chest seals to treat open chest wounds to prevent the development of a tension pneumothorax.

Other First Aid Supplies

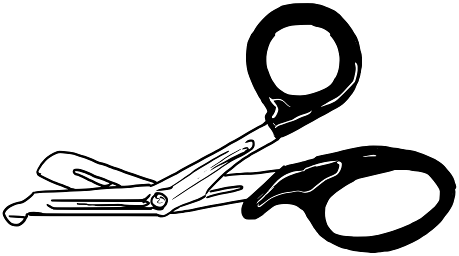
The following items help complete a first aid kit in addition to items for wound care and infection control.

Trauma Shears

Trauma shears (Figure 28.7) are scissors used by medics to cut clothing from patients. They are stronger and sharper than household scissors, and the bottom blade has a blunted tip to help prevent patient injury during use. Shears are also useful for cutting medical tape and bandages.

Household scissors are often confiscated by law enforcement as they can be used as weapons. Trauma shears have a more “medical” look to them and are difficult to use as a weapon. For these reasons, law enforcement are less like to confiscate them. Trauma shears also come in heavy-duty models for cutting through leather and motorsport padding. These are unnecessarily large and heavy for most medic usage, and they have higher likelihood of being confiscated by law enforcement.

Figure 28.7: Trauma Shears[71]



Tweezers

Tweezers are tools used to picking objects that are too small to be grasped with one's fingers. Metal tweezers with a fine point are useful for removing splinters or foreign objects from wounds. Plastic tweezers are used when applying adhesive bandages or wound closure strips to prevent the bandages from sticking to your gloves. Speciality tweezers exist for removing ticks and other parasites from a patient's skin.

In order to prevent the transmission of bloodborne pathogens between patients, all tweezers should be treated as single-use. If you do reuse tweezers, at a minimum they should be disinfected with isopropyl alcohol.

Eyewash Bottles

Eyewash bottles are used to flush debris or chemical irritants from a patient's eyes. Pneumatic eyewash bottles are preferred to improvized bottles. They allow a patient to keep their head tilted forward while you flush their eyes, preventing irritant and debris from getting in their eye or mouth. It is also easier to control the pressure of the stream, especially as the bottle empties. You should acquire pneumatic eyewash bottles with a cap that prevents leakage. Some designs simply have a cap that is meant to act as a cover to prevent contaminants from entering the opening while it is not in use. Such designs do not form a watertight seal and will leak in your bag.

Contact solution bottles (both saline and cleaner) can and repurposed as eyewash bottles.[vii] Recyclable plastic water bottles can also be used. If you can, acquire one with a push cap. If not, use an awl to make 5 to 10 small holes in the cap. Use a second cap to keep the bottle sealed when it is not in use.

[vii] Though it should be noted that you should not use contact solution cleaner as an eyewash solution.

No mater what kind of eyewash bottle you use, fill it with either water or saline. More information about eyewash bottles can be found in Chapter 13 ("Riot Control Agent Contamination").

Emergency Blankets

An emergency blanket is an ultra-thin, lightweight blanket made of heat-reflective material. Emergency blankets are also called space blankets, rescue blankets, and Mylar blankets.[viii] These blankets can be used to warm a patient while treating hypothermia and shock. Even on warm days, these should be packed as patients can cool rapidly, especially if they are being decontaminated from riot control agent as they will be wet and may not be able to put clothing back on.

Instant Cold Compresses

An instant cold compress is a single use bag that when squeezed becomes cold. These bags have two compartments that contain chemicals that when combined create an endothermic reaction. Instant cold compresses do not require the medic to freeze them in advance, so they can be carried during long, hot actions. Cold compresses are used to treat joint injuries, closed soft tissue injuries, and insect stings.

Refrigerant Spray

Refrigerant spray is a can of compressed gas that rapidly cools when sprayed. Refrigerant spray is sprayed on to the skin to cool it and provide brief pain relief. Patients who have been severely contaminated with riot control agents benefit psychologically from brief treatment with refrigerant spray even though it does not remove or deactivate the chemical irritant. This is a useful tool to calm patients.

Additionally, instant cold compresses are heavy, so you cannot carry many of them. Patients may ask for them if they received minor wounds while fighting the police. You likely cannot give an instant cold compress to every patient who asks for one. Some patients can be comforted with use of refrigerant spray.

Note that some types of refrigerant spray are used for "burning" off warts and others are used to numb the skin during anesthetic injections. These types should not be used for minor pain relief.

[viii] Mylar is a brand name for BoPET (biaxially-oriented polyethylene terephthalate), a type of polyester film.

Instant Heat Packs

Instant heat packs come in the form of small hand warmers or larger instant hot compresses. Hand warmers can be useful during cold actions for reducing discomfort and keeping people in the streets. No instant heat packs provide enough heat to treat hypothermia.[25] Instant hot compresses are relatively heavy and the benefit gained by carrying seems to be minimal.

Triangular Bandages

A triangular bandage is a piece of semi-durable cloth approximately 90 cm × 120 cm. A triangular bandage can be used as a tourniquet, wrap for dressings, a sling for a broken collarbone, or as support for a sprained joint.

Elastic Bandages

An elastic bandage, also called an Ace bandage, is a stretchable bandage used to create localized pressure. They are often used to support strains and sprains. Elastic bandages may come in a number of sizes, but a 5 cm width is the most versatile. Elastic bandages come with hook fasteners used to secure the bandage.

Blister Bandages

Protesters often get blisters on their feet, and these can be treated with speciality blister bandages or moleskin.

Splints

A splint is a device used to support or immobilize a limb. A flexible metal splint with foam coating can be used to immobilize bones in the hands, arms, or lower leg.[ix] These usually are two pieces of foam wrapper around a metal core. They are very pliable and can be wrapped around an arm or leg. Foam splints usually are packaged as a roll for compact storage.

Finger splints are available as metal with foam for comfort or of similar construction as a foam splint for a long bone. Finger splints can, however, be easily improvised using cardboard or sticks, and fractured or dislocated fingers can be buddy taped.

Large splints like a traction splint for a fractured femur are too large and impractical for medics to carry.

[ix] The SAM splint (structural aluminum malleable splint) is a name brand, but other variants exist.

Cervical Collar

A cervical collar, more commonly known as a neck brace, is a medical device used to support the neck and stabilize the cervical spine. Cervical collars come in different varieties designed for EMS use or convalescence. You should acquire an adjustable, plastic cervical collar that can be laid flat in your bag.

Some EMS providers are opting to not use cervical collars as they may cause increased intracranial pressure and may not provide any benefit.[194] The degree to which this applies to riot medicine, which is more like combat medicine than traditional emergency medicine, is unclear. As such, their use is still recommended.

Diagnostic Equipment

The following equipment is used to assist medics with diagnosis.

Pulse Oximeter

A pulse oximeter is a device that noninvasively measures a patient's pulse and peripheral blood oxygen saturation (SpO_2). A pulse oximeter is placed on a patient's finger, and within a few seconds provides a readout for heart rate and oxygen saturation. There are different types, some of which are more professional and more expensive. Medics are recommended to acquire the models that are a simple finger clip.

Some models additionally display a waveform that shows pulse pressure. This is an alternative means of measuring the regularity of heartbeats. Such models seem to be becoming standard.

Stethoscope

A stethoscope is a device used to amplify sounds within the body. For medics, it will primarily be used when measuring a patient's blood pressure with a sphygmomanometer.

Sphygmomanometer

To measure blood pressure, a blood pressure monitor is recommended as it provides more accurate measurements than a medic's assessment of a patient's pulse as "strong" or "weak." Measuring blood pressure is often done with a sphygmomanometer and stethoscope. This method is reliable, more accurate, and requires no batteries like an electronic blood pressure meter does. Additionally, a sphygmomanometer can be used as a makeshift tourniquet in emergencies.

Blood Glucose Monitor

A blood glucose monitor is device that measures the amount of glucose in the blood. In the field, this is done by pricking a patient's finger and applying the drop of blood to a disposable electrode that attaches to a monitoring device. The device instantaneously displays the patient's blood glucose level. A blood glucose monitor is useful for testing for hyperglycemia and hypoglycemia. Along with the meter, you should carry extra lancets and test strips.

Lancets should be single-use to avoid cross-contamination between patients. Do not use a reusable lancing pen with disposable tips. If you are unable to find single-use lancets, use the disposable tips from a lancing pen to manually prick patients' fingers.

Penlight

A penlight is a small, pen-shaped flashlight that can be used to check the dilation of a patient's eyes. These may be carried in addition to a handheld flashlight since they can be clipped to a pocket for ease of use. They are recommended over flashlights as for testing pupils as they are not painfully bright.

Mirror

A small handheld mirror can be useful during a patient examination. Medics often must assess a patient's skin color to determine if they may be injured. This comparison is not absolute but needs to be done against a baseline. Patient's are often the only ones who know this baseline, so you may want to hold up a mirror and ask the patient if their skin color is normal.

Thermometer

A thermometer is used to measure a patient's body temperature. There are many types of thermometers, but the recommended is an electronic oral thermometer with disposable covers. You should not use a mercury-filled glass thermometer as it may break and poison you patient or contaminate your other equipment. Ear thermometers are often inaccurate because of misuse. Forehead thermometers should not be used because their gun shape can retraumatize patients. If you expect to treat hypothermic patients, ensure you thermometer is rated for temperatures below 35.5 °C or you may get inaccurate readings.

Medication

If you are considering carrying medication, you should consult local medics on their practices and ask them about the legality of carrying and administering medication. A longer discussion of the merits of packing medication can be found in Chapter 9 ("Medication").

OTC Analgesics

Over-the-counter (OTC) pain medications (analgesics) are pain relief medications that are available without a prescription. Common OTC analgesics are ibuprofen (e.g., Advil), paracetamol (also known as acetaminophen, e.g., Tylenol), naproxen (e.g., Aleve), or aspirin. Aspirin can be used to treat patients having a heart attack. Of these pain relievers, ibuprofen, naproxen, and aspirin are all also nonsteroidal anti-inflammatory drugs (NSAIDs).

Salbutamol Inhaler

Salbutamol, also known as albuterol, is a bronchodialator used to treat asthma. Salbutamol is administered via a metered dose inhaler (MDI). Asthmatic patients may have their own inhaler, but if they do not, carrying an inhaler can be used to treat acute asthma. If you carry an inhaler, consider additionally acquiring a spacer tube to improve delivery of the medication.

Epinephrine Autoinjector

An epinephrine autoinjector, often called by the name brand EpiPen, is a device that delivers a pre-measured intramuscular dose of epinephrine to a patient. Patients with allergies may carry these in case they come in contact with allergens. You may choose to carry one since patients may not bring their epinephrine autoinjectors to actions.

Antihistamines

Antihistamines can be used to treat allergic reactions and anaphylaxis. First and second generation antihistamines may cause drowsiness as a side effect.[x] For this reason, third generation antihistamines are preferred.

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[x] Some medics use antihistamines such as Benadryl as a mild relaxant to help panicked patients. Whether or not this is advisable is questionable. I personally would not suggest using antihistamines in this fashion as it falls outside of (or at least on the fuzzy border of) a medic's scope of practice.

Naloxone

Naloxone is an medication that blocks the effects of opioids and is used to treat opioid overdoses. It is often sold as a nasal spray under the name Narcan. Medics may find this useful to carry both to demos and on their person at all times if there are frequent opioid overdoses in their region.

Basic Life Support

These items are using during basic life support and for ensuring a patient has a clear airway.

Artificial Ventilation Device

A pocket mask (sometimes simply called a CPR mask) and bag valve mask (BVM) are an devices used to manually ventilate a patient's lungs. A pocket mask is used by a medic to blow air into the patient's lungs. A BVM uses a self-inflating bag to ventilate air from the atmosphere into the patient's lungs. Illustrations of these devices as well as their use can be found in Chapter 11 ("Basic Life Support").

For both pocket masks and BVMs, the mouth attachment comes in varying sizes. This is usually adult, child, and infant. You will typically be treating adults, so get the adult size.

In addition to the pocket mask, there exists a second type of CPR mask commonly called a keychain CPR mask. This type is small, about 2 cm × 2 cm × 1 cm when folded. It is a sheet of plastic with a one-way valve that is held against the patient's mouth. Because these are so small and cheap, it is useful for a medic to always carry one on their person even when not at actions.

Note that BVMs come in single-use and multi-use models.

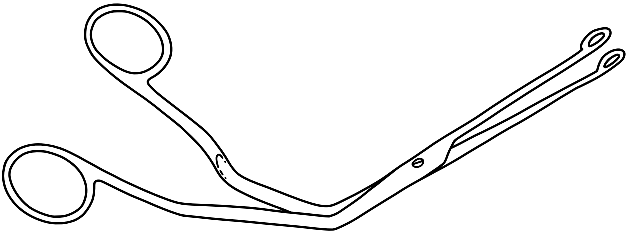
Magill Forceps

Magill forceps (Figure 28.8) are used to remove foreign bodies from a patient's airway. The use of Magill forceps protects a medics fingers from injury, and their narrow profile makes it easier to see into a patient's mouth while using them. Magill forceps come in different sizes. Ensure you acquire the adult size, approximately 20 cm in length.

Manual Suction Pump

A manual suction pump is a hand-actuated pump that uses a catheter to suck fluids and small objects from a patient's airway. Note that manual suction pumps come in single-use and multi-use models.

Figure 28.8: Magill Forceps[12]



Disposable Razors

Disposable razors are used to remove a patient's body hair to help bandages stick or to prepare the patient for treatment with an AED. Body hair can prevent an AED's contacts from sticking to the patient which can reduce or negate its effectiveness.

AED

An automated external defibrillator (AED) is an automated, portable medical device that can diagnose shockable rhythms and treat them via defibrillation.

For most actions, you will not be able to nor need to bring an AED. They are prohibitively expensive for most medic teams, they are relatively heavy, and they take up a significant amount of space. Most actions will take place in urban and suburban environments, so if the need arises, you may be able to find one in an office, gym, or restaurant. Medics have reported having some amount of success convincing law enforcement to break down doors to buildings to find an AED when one was needed. Your luck with this tactic will vary.

You should only consider acquiring and carrying one if you are part of a well established and well organized medic collective. An AED takes up roughly half the space of a normal sized EMS backpack. Cost wise, two fully stocked EMS backpacks can be acquired for the same price as an AED, and the former are substantially more useful. Carrying an AED should not take precedence over more commonly used medical equipment, personal protective equipment, or useful personal items.

Miscellaneous

The following items are used for treating patients but do not fit neatly in to the previous categories.

Plastic Trash Bags

Plastic trash bags are quite versatile and should be included for several reasons. Their main use is to collect trash and biohazardous waste. Trash bags can be used as makeshift examination gloves in the event you run out. Most importantly, a trash bag can be used to fashion an occlusive dressing to treat an open traumatic pneumothorax . Plastic trash bags should be small (under 5 L).

Safety Pins

Safety pins can be used to close slings made using triangle bandages. They can help hold a torn bag closed. They can also be used to prick a finger for blood testing if the medic does not have lancets.

Sugary Food

Patients suffering from low blood glucose, diabetic or otherwise, can be treated with simple, sugary food. The best options have minimal ingredients (because of allergies) and will be something diabetics are already familiar with. Dextrose (glucose) or sucrose tablets are often available in hypoallergenic formulations. Acquiring packs of dextrose gel or granules is advisable as these can be used for treating unresponsive patients with possible hypoglycemia.

Electrolyte Drink Mix

Electrolyte drink mix, either as a powder or dissolvable table, can be use to treat heat cramps and help with dehydration. These mixes have a variety of salts and sometimes sugar. When acquiring drink mix, attempt to find the most hypoallergenic blend possible, namely without coloring or flavoring.

Carry Tarp

A carry tarp, sometimes called an extraction tarp or carrying sheet, is a tarp with handles used to carry patients. Carry tarps are usually vinyl with handles made of webbing. Some carry tarps have rubber or PVC handles to reduce hand pain while carrying patients.

Carry tarps have weight limits. Your carry tarp should be clearly marked with the weight limit to help prevent misuse. This can be done with white duct tape and permanent marker.

Carry tarps are heavy (1.5 kg or more) and even when rolled tight take up a great deal of space (around 3 L). Because of this, they are not generally recommended unless medics expect to evacuate non-ambulatory patients. If they are carried, there should not be more than one carry tarp per medic team. Carry tarps should typically be rolled up and strapped to the outside of a bag.

If you choose to acquire a carry tarp, consider also searching for patient transfer sheets. These may be a lighter, smaller, and cheaper alternative. Some transfer sheets are only the size of a large pillowcase and are only meant to support the patient's torso while moving them from one stretcher to another. These should be avoided. Full-size, single-use transfer sheets may be made of a durable plastic but not have built in handholds. They should not be used to transfer patients significant distances, and medics may want to consider doubling them up to prevent them from tearing and causing the patient to fall.

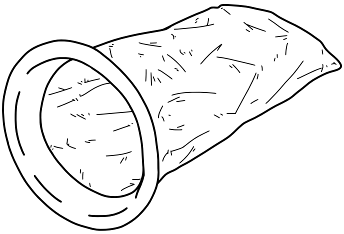
Tampons

Tampons are useful to carry in a variety of sizes in case any protesters have unexpected menstruation.

Vomit Bag

A vomit bag (Figure 28.9) is a bag with a opening that holds its shape to prevent the bag from closing as the patient vomits. These bags may be paper (such as airplane vomit bags) or plastic. Vomit bags are useful because they help prevent they patient from vomiting on themself or the ground. The sight and smell of vomit may cause bystanders to vomit. Normal trash bags can, of course, be used for this purpose.

Figure 28.9: Vomit Bag[12]



Cheat Sheets

Some medics carry laminated "cheat sheets" that contain condensed diagnostic and treatment information. This may include:

- Normal and abnormal values for vital signs
- Mnemonics and checklists for patient assessment

- Sign, symptoms, and treatment for various diseases

These references can be useful during emergencies, especially if medicine is not your primary field of work.

29 : Personal Protective Equipment

> The history of progress is written in the blood of men and women who have dared to espouse an unpopular cause, as, for instance, the black man's right to his body, or woman's right to her soul.
>
> Emma Goldman

In order to be able to effectively render care to others, you must keep your self sufficiently safe to be able to reach them and avoid injury until the end of the action. This chapter will discuss non-medical personal protective equipment (PPE). This equipment will help keep you safe from flying bottles, chemical agents, and other dangers you may encounter while in the field.

It may be illegal to wear PPE or even bring it to demonstrations. Some regions classify PPE as weapons or "passive weapons" (items designed to make the wearer resistant to police violence). You will need to decide what (if any) items you will bring or wear to actions by considering both the risk of bodily harm and police repression tactics. Discussion of what equipment you may want to bring or wear are discussed in Chapter 31 ("Packing Your Bag") and Chapter 32 ("General Tactics") respectively.

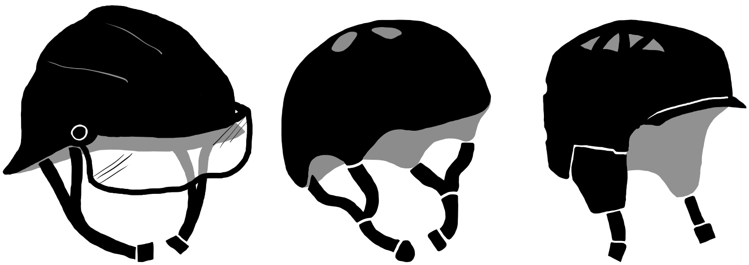
When if comes to protection against chemical agents, most medics are only concerned with protection against riot control agents (RCAs). Protection against biological, chemical, and radiological weapons is outside the scope of this book.

Helmets

Above all else, you should protect your head. The ideal helmet will not just protect the top of your head but also your neck and face.

The best helmets are those designed for rescue services and firefighters (Figure 29.1a). These helmets extend further past the ears than a bike helmet. They often have build in visors that can be lowered over the eyes or the entire face. Many models have clips for flashlights, and most have attachments for a plastic or leather extension, sometimes called a "lobster tail", that extends to cover the neck. The lobster tail offers a small amount of protection and prevents debris from falling between the wearer's clothing and back. Rescue helmets usually come with internal adjustable webbing to ensure a good fit both with and without a full-face respirator. These helmets are the easiest to wear with a respirator since they are specifically designed for this.

Figure 29.1: Helmets[9]



(a) Rescue (b) BMX (c) Snowboard

Rescue helmets are also the most expensive, but as fire departments or EMS providers replace theirs, you may be able to acquire them for cheap or for free. Despite the cost, if the kinds of actions you attend frequently have violent clashes between police, the added protection is worth it.

Other common options are BMX-style bicycle helmets (Figure 29.1b) and ski or snowboard helmets (Figure 29.1c). These types are relatively cheap and can easily fit both full-face and half-mask respirators. Additionally, some medics use tactical, climbing, hockey, and construction helmets, though these are less common. Whatever kind of helmet you get, ensure it has enough padding to fit snugly on your head both with and without a respirator.

American football or lacrosse helmets are not recommend as the protective metal wiring in front of the jaw area can be easily grabbed, and it is impossible to fit a respirator under them. Most motorsport helmets are not recommended as they are far too large and heavy for most situations medics encounter. Baseball helmets are not recommended because they do not have a chin strap and can be easily knocked off the wearer's head.

If wearing a large, protective helmet is infeasible, hardware stores often carry baseball hats with a hard plastic shell on the inside. These hats look nearly indistinguishable from a normal baseball hat and may help you avoid scrutiny.

If you choose to equip yourself with a helmet, you may want to mark it with your region's medic logos or symbols. This makes it easy for others to find in a crowd if they are searching for medical assistance. Medics may also position themselves as neutral to avoid police repression, and clear markings may help with that. Further discussion about neutrality can be found in Chapter 32 ("General Tactics").

Gloves

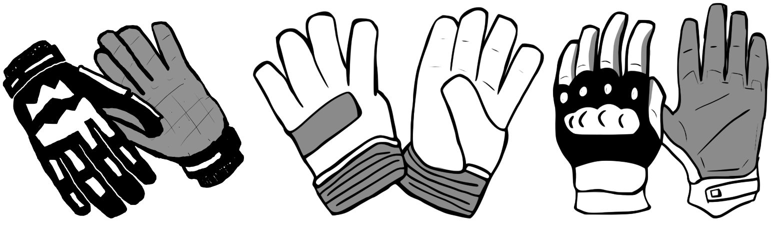
Aside from examination gloves, you may want gloves to keep your hands warm and dry in cold weather or protective gloves. Mild hypothermia and cold hands lead to reduced dexterity and sensation, both of which can make it hard to render care and to do so safely.

For most occasions, you will want to carry some kind of thick glove to protect you hands from injury. Common risk to you hands includes shattered glass, projectiles, and riot control measures such as flashbang grenades or rubber bullets. You will also want gloves that allow you climb and move large objects to reach patients. You may also have to pick up and throw still burning cans of tear gas, so to avoid thermal burns, your gloves should be thick. Be cautious of synthetic materials that melt as this will not offer protection from burning tear gas cannisters.

Rescue service gloves (Figure 29.2a) are specifically made for exactly these purposes, and they are not very expensive. They come in a variety of models that usually have thick but soft padding and are resistant to cuts and heat. Some types additionally have plastic spines to protect the back of the wearer's hands. Rescue services gloves are recommended. These gloves also typically do not look like the kind of gloves rioters wear to fight their opposition or cops, so they will draw less scrutiny from law enforcement.

The cheapest option for this are simple work gloves (Figure 29.2b), usually made of leather. They are thick enough to allow you to work with your hands and pick up tear gas canisters, but they do not offer much impact protection. Some mechanic and work gloves have a plastic spine on the fingers and/or knuckles to protect from impact. Similarly, assault gloves (Figure 29.2c), also known as firearms gloves or tactical gloves, will have thicker padding and armor than mechanic gloves. The drawback is that assault gloves tend to be the most conspicuous which may draw unwanted attention from law enforcement.

Figure 29.2: Gloves[9]



(a) Rescue (b) Work (c) Assault

Eye Protection

You will want to protect your eyes from impact, projectiles, explosives, and chemical agents. There are many ways to protect your eyes from the various ways they could become injured during an action, and you may choose to acquire one or many options. Not matter what you pick, you should ensure that the eye protection is shatter proof.

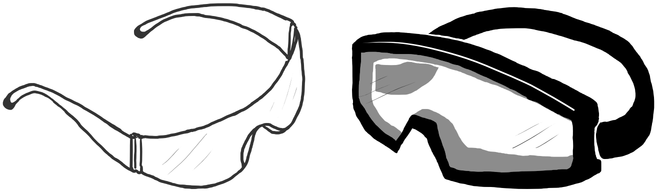
As noted in the discussion of helmets, some helmets come with built or attachable visors. These will offer protection against projectiles and explosives and may offer some protection against sprayed chemical agents, but not vaporized or aerosolized chemical agents.

The simplest and cheapest solution for protection against projectiles and sprayed chemicals are safety glasses or safety goggles used for construction (Figure 29.3a). They are often form-fitting to the face and eye socket and will generally protect against impact, projectiles, sprayed chemical agents. Safety googles will usually fit around most corrective glasses. Motocross goggles are more expensive but may be more comfortable to wear with a helmet (Figure 29.3b).

If you expect tear gas or other vaporized or aerosolized chemical agents to be deployed and do not have a full-face respirator, you can protect your eyes using swimming goggles. Diving masks should be avoided because respirators are designed to fit over the nose. Additionally, if you are using ski or motorsport goggles, you will need to seal the vents with caulk or another sealant to help prevent tear gas from entering and irritating the eyes. You may additionally need to remove the foam padding and replace it with silicone so that it can form a more airtight seal against your face.

All of these options can be combined with half-mask respirators. Additionally, some medics may wish to double up swimming goggles

Figure 29.3: Eye Protection[9]



(a) Safety Glasses (b) Motorsport Goggles

with motosport goggles for protecting against both chemical agents and impacts. Regardless of what eye protection you use, be advised that even lightly tinted lenses can be a significant hindrance at night. The identity protection they provide may not be worth it, or you may want to carry both clear and tinted eye protection.

Hearing Protection

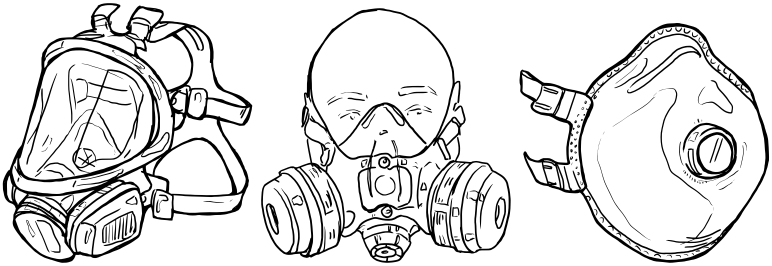
There will be many things that can damage your ears and hearing during actions. Explosive pyrotechnics, flashbang grenades, other explosives, acoustic weapons, and even prolonged exposure to loud music or megaphones can damage your hearing. The simplest solution to this is to carry disposable foam earplugs. When acquiring earplugs, look for the highest decibel reduction rating you can find. You should use a noise reduction rating (NRR) of -30dB or higher and avoid using a rating lower than -20dB. Additionally note that some types of rescue helmet have built-in earmuffs, or ear muffs can be acquired and mounted to most types of helmets.

Protesters and other attendees at most actions do not carry hearing protection, so it is useful to carry bulk foam earplugs to hand out. This is especially true at actions where children and the elderly are present as they tend to be the ones most likely to want hearing protection. A single earplug can be cut in half lengthwise to fit a child's ear.

Respirators

Respirators offer protection for your respiratory system from particulate matter and chemical agents. In particular, you need to protect yourself from riot control agents (RCAs). Respirators come in several styles as well as different levels of filtration for different kinds of particles and chemicals. The standards and specifications vary by region, so for your own safety you may need to do your own research to find a respirator with appropriate filtration levels. Most major manufacturers rate their products for use in the United States or EU, so these standards will likely apply regardless of where you live.

Figure 29.4: Types of Respirators[71]



(a) Full-Face (b) Half-Mask (c) Filtering Half-Mask

The kinds of masks that will be discussed are full-face respirators, half-mask respirators, and filtering half-mask respirators. Examples of these can be found in Figure 29.4. Discussion of other types of respirators is outside the scope of this book since they are not necessary for medics.

Respirator Ratings

Respirators are rated on how much substance they can filter (protection factor, PF), how much substance enters gaps in the mask (leakage, fit factor), and what types of substances a filter is capable of removing from the air.

NIOSH defines three letter markers and three levels for particulate filtration (Table 29.1). Similar ratings in the EU are provided by standard EN 143 for particulate filters (Table 29.2) and EN 149 for filtering half-mask respirators (Table 29.3).

There are two primary modes of failure for filters. Blockage is when the filters accumulate so much particulate matter that it becomes difficult to breathe. Breakthrough is when the filter fails and the wearer begins to detect the chemical agent. Breakthrough may occur immediately if an incorrect filter is selected. If a proper filter is selected, both of these cases mean you will need to replace the filters.

No matter what kind of respirator or filters you are considering, activated coal filters are not necessary. They are typically more expensive

Table 29.1: NIOSH Ratings for Particulate Filtration[195]

Oil Resistance	**Rating**	**Min. % particles filtered**
Not oil resistant	N95	95%
	N99	99%
	N100	99.97%
Oil resistant	R95	95%
	R99	99%
	R100	99.97%
Oil proof	P95	95%
	P99	99%
	P100	99.97%

Table 29.2: EN 143 Particulate Filtration Ratings

Class	**Filter penetration (at 95 L/min air flow)**
P1	Filters at least 80% of airborne particles
P2	Filters at least 94% of airborne particles
P3	Filters at least 99.95% of airborne particles

Table 29.3: EN 149 Filtering Half-Mask Ratings

Class	**Filter penetration (at 95 L/min air flow)**	**Leakage**
FFP1	Filters at least 80% of airborne particles	$< 22\%$
FFP2	Filters at least 94% of airborne particles	$< 8\%$
FFP3	Filters at least 99.95% of airborne particles	$< 2\%$

and do not offer enough of an improvement over similar filters against RCAs to be worth the extra cost and weight.

Respirator Types

Filtering half-mask respirators are made from a filtering material, cover the mouth and nose, and are held in place with elastic straps. Some models come with a one-way valve for exhalation. Simple masks for dust are not sufficient for protection against RCAs. Masks rated FFP1, FFP2, N59, N99, and N100 should be avoided (though they are better than nothing). A rating of FFP3 or at least R95 should be used, and respirators rated P100 are ideal. These masks are typically labeled as being safe to use with paints or solvents. Note that filtering half-mask respirators are single-use and should be discarded after they are used.

Reusable half-mask respirators are usually made of silicone, cover the mouth and nose, and are held in place with elastic or rubber straps. These masks may be single use and come with built-in filters, or the filters may be replaceable. Some models come with no filters, so they must be acquired separately. The mask's silicone material will fit better against your face than then textile material of a filtering half-mask. This reduces leakage.

Full-face respirators off the added protection of protecting your eyes from chemical agents. However, they are larger and more costly than combining swimming goggles with a half-mask.[i] Like with half-masks, you may need to acquire filters separately. If you are using the EU standards in Table 29.4, a Class 1 mask is acceptable, Class 2 is preferred[ii], and Class 3 is unnecessary. To protect the plastic lens (face shield) from scratches, you may want to acquire protective covers that can be replaced when they are scratched.

Full-face respirators should not be worn with any kind of glasses. The arms of the glasses will not allow for a proper seal to be made. Most industrial full-face respirators will have attachments for corrective lens that can be mounted to the forehead or nose piece. Do not wear contact lenses with a full-face respirator. If chemical agents break through, you

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[i] Cheap and easy to acquire gas masks are the Russian GP-5 and various types of Israeli civilian gas masks. The GP-5 has the additional advantage of using standardized 40 mm filters so that replacements can be easily acquired. The GP-5 has the disadvantage of a significantly reduced field of vision. I prefer modern full-face and half-mask respirators as they are more ergonomic and have better fields of vision.

[ii] Here "preferred" means that they provide superior protection and comfort. Due to their cost and the risk of damage or theft by the police, you may chose to get a Class 1 mask.

Table 29.4: EN 136 Full-Face Respirator Classes

Class	**Description**
Class 1	Light Duty
Class 2	General Duty
Class 3	Heavy Duty (for firefighters)

will have to remove the mask to remove your contacts. This will lead to additional contamination as well as inhalation of chemical agents. Likewise, when using goggles in combination with a half-mask respirator, you should not wear glasses or contact lenses.

Respirator Use and Considerations

When acquiring a full-face or half-mask respirator, take note that they come in different sizes. You may need to try multiple models to find one that seals well on your face.

If you have facial hair, it should be shaved or trimmed to stubble. Presence of facial hair can prevent your respirator from sealing tight against your skin. This can cause leakage. As a note, you should not shave with a razor directly before an action as the micro-cuts on your skin will be exposed to chemical agents.

Full-face and half-mask respirators should be cleaned after usage, and stored in a cool, dry place. The exact care for your mask will be included in its instructional guide.

You should store your respirator in an air-tight plastic bag to prevent the filters from degrading. The exact lifetime of your filters will vary, and their instructional guides will contain this information. Using any filters after their expiration can be harmful.

When exposed to tear gas during an action, there are steps you can take to don your respirator to minimize how much tear gas you inhale. To properly don and clear full-face respirator, use the steps below. This similarly applies to a half-mask respirator used with goggles.

1. Stop breathing.
2. Remove your glasses or contact lenses (if applicable).
3. Close your eyes.
4. Put on your respirator and adjust the straps to get a tight fit.
5. Cover the exhalation valve (if possible), exhale hard to fully to “clear” the mask, then uncover the valve.

6. Cover the inhalation filters (if possible) and attempt to inhale to create negative pressure to help seat the mask on your face, then uncover the filters.
7. Begin breathing normally and open your eyes.

If you do not have access to a mask, holding a piece of cloth that is damp with water over your nose and mouth can minimize the amount of chemical agent you inhale. A further discussion of protection against RCAs and related urban legends can be found in Chapter 13 ("Riot Control Agent Contamination").

Soft Knee Pads

In most circumstances, you will not have access to gurneys, examination tables, or even foldable cots. Patients will often be sitting or laying on the ground while you treat them. If you have to immobilize a patient's spine, you may be on your knees for many tens of minutes. Treating patients while on your knees can be discomforting, distracting, or even painful. Volleyball and handball knee pads are light, soft, and unobtrusive protection you can wear to make you more comfortable. Alternatively, some work pants have padding sewn into the knees.

Additional Armoring

Medics are usually not directly on the front line, and as such in many regions they are not the main target of repression tactics. Additional protective equipment is generally not necessary. There are some items that medics will still choose to wear to allow them to do their jobs without fear of injury.

Association football shin guards can be worn and easily hidden under loose pants. Riot cops may kick the shins of protesters and medics alike when the are trying to get them to move as a way of enacting concealed violence. Shin guards will make this significantly less painful.

Instead of soft knee pads, medics may wear hard plastic knee pads for skateboarding or inline skating. If knee pads are worn with shin guards, try to find sets that do not leave an exposed gap between the shin guard and knee pad. You may want to consider acquiring the combined lower leg pads the have had plastic from the instep of the food to the knee. Similarly, medics may wear combined elbow and forearm pads. However, all of these are more conspicuous and may not be necessary unless you are fighting cops on the front line.

Some medics may wear athletic cups to protect their external sex organs against injury from direct or indirect hits from less-lethal projectile weapons including tear gas cannisters and rubber bullets.

Police are trained to target the common peroneal nerve with their batons. A strike to this nerve can temporarily disable usage of the affected leg (transient neurapraxia). The kind of padded shorts used in American football and downhill mountain biking can offer protection against this kind of temporary disability provided the pads go far enough down the thigh. These types of pads are meant to be worn under pants and can be somewhat concealed.

If your opponents are armed with knives, even as a medic you may face risk to your life. A stab proof vest may be advisable, but they may lead to overheating and add weight that would be better suited for medical equipment or other provisions. Beyond this, small arms fire can be protected against by a bullet proof vest, and protection against higher caliber rounds can be provided by a plate carrier. These items are large, heavy, and tend to be quite conspicuous. At the point at which a medic is wearing these, additional protective measures are needed like a kevlar helmet. Detailed discussion of this level of protection is outside the scope of this book.

30 : Other Gear

> Duct tape is not a perfect solution to anything. But with a little creativity, in a pinch, it's an adequate solution to just about everything.
>
> Jamie Hyneman, *Mythbusters*[196]

This chapter will cover additional gear you will want to consider wearing or carrying to an action. Some of these things are comfort items that make your job easier and less arduous, and others will help you with your duties.

Essentials

Describing the following items as "essentials" may be an overstatement, but they are exceptionally useful to bring to every action.

Food and Water

You should always bring food and water for yourself. A reusable water bottle, aside from being good for the environment, is less likely to burst if you are hit. To encourage hydration, you may want to bring flavored powders with electrolytes to add to you water. For food, energy bars and oatmeal bars are good choices because they are small but high in calories and will not spoil. Some medics take a more minimal approach and bring just dense bread. Regardless, you may need to experiment with what food you can tolerate while exercising or nervous.

Duct Tape

Duct tape is a generally very useful item. It can be used to repair your bag or clothing as well as seal a small crack in a full face respirator. It can be used to hold a bandage in place or as a bandage itself.[i] Duct tape is so useful, it has been carried on all NASA mission since the early 1960's and even was used to repair the Apollo 13 carbon dioxide filters.[197] Your duct tape should be black to avoid marking patients who are members of the Black Bloc.

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[i] Duct tape has latex in it and may cause an allergic response in patients.

Phone

Your phone is your primary communication and intelligence gathering device. Encrypted messaging apps will allow you to coordinate with other medics and organizers. You may have scouts who report information directly to you. Twitter or other social media feeds may provide useful live updates on blockades, protester movements, opposition movements, and police movements.

Whether or not you should bring a phone or what kind of phone you should bring along with the security implications associated with phones is discussed in Chapter 34 ("Operational Security").

Wallet

Depending on local laws, you may be required to present identification to law enforcement, even in non-protest environments. Identification may help you with getting bailed out of jail. Carrying a health insurance card may help you receive prompt medical care if you are injured and taken to a hospital. Cash, bank cards, or credit cards are generally useful. If you are concerned about the security implications of carrying IDs on you person at actions, a discussion of how IDs can be targeted by digital surveillance is discussed in Chapter 34 ("Operational Security").

Permanent Marker

A black, permanent marker with a large tip is useful for writing emergency contact information on your body. Phones may become damaged, and normal ink may be rubbed or washed away. When writing a phone number on your body, ensure it is not visible as it may cause you or your emergency contact to get doxxed or harassed. Permanent markers can also be used to write notes on yourself or the patient.

Notepad

A notepad is useful for taking down measurements and notes from a patient. This may help with determining if their condition is degrading or improving, and these notes may be useful for other medical professionals who take over care. Notepads can also be used to document police badge numbers or the names of arrestees. This information can be passed on to anti-repression and jail support group.

Paper Map

You should carry paper map with routes, rally points, and other points of interest. If you expect precipitation, you may want to consider using a plastic sleeve or laminating your map. A hard copy of the map for your action is a good back up even if you have a phone. Cell service may be cut, you phone may run out of charge or become damaged, or you may not want to constantly be fishing for your phone while jogging with a crowd.

Tissues

Packages of tissues are useful because they are a more pleasant alternative to gauze to give to patients who need to blow their nose or dry their eyes. Tissues also carry the psychological benefit of feeling more familiar than gauze to help patients regain a sense of normalcy after a traumatizing experience.

Watch

A wristwatch or pocket watch is useful for keeping track of time without having to pull out your phone. A watch is also useful for measuring heart rate. Your watch should be digital, or if it is analog, its should tick (not rotate smoothly) to get more accurate readings. You watch should be water resistant, and the straps should be plastic. Textile strap, leather straps, and metal links will absorb and trap more riot control agent and bodily fluids.

Personal Medication

If you take medications either regularly or in emergency situations, you should consider carrying several days worth of medication with you in the event you are arrested. You may also want to take a photocopy of your prescription to help reduce the likelihood that your medication is confiscated during your arrest. These medications should be stored separated from the medication you hand out, preferably in a pocket or small bag that is unlikely to be confiscated or lost during your arrest.

Batteries

For every electronic device you carry that takes replaceable batteries, you should bring spares. This means flashlights, blood glucose monitors, or pulse oximeters.

Nice-to-Haves

The following items are generally useful and are things you should consider bringing with you.

Small Bag

A second, small bag is useful for carrying frequently used items like examination gloves, gauze, medical tape, and trauma shears. A waist bag (fanny pack, hip bag), utility belt, or utility pouch (either strapped to your thigh or slung over your shoulder) provides easy access to these items. You may find this convenient for quickly treating patients while walking instead of stopping and removing your main bag.

Baseball Hat

A baseball hat can protect your eyes and face from direct sunlight, but a reason you may want to wear one to actions is the brim can partially shield your eyes from sprayed chemical agents. You may not always be wearing your eye protection, or an incident may occur without warning. By quickly tilting your head down, you can avoid most of the chemical agent in a direct spray. Likewise, this can be done to help protect your identity if you spot photographers. A hat with medic markings also makes you more visible in a crowd.

Umbrella

An umbrella can be used to keep you dry in the rain or provide shade in the heat. They can be used to block cameras from the police, fascists, or nosy journalists[ii]. They also provide some measure of protection against water cannons and sprayed riot control agents.

Backpack Rain Cover

A backpack rain cover is a waterproof cover that can be pulled over a backpack to protect it from the rain. These are useful during rainy actions or actions where water cannons may be deployed. Riot control agents may be mixed with the water from water cannons, and contaminated equipment may be harmful to patients.

Phone Battery Pack

If you bring a phone, a spare battery pack and charging cable will ensure your phone has charge for the entire action. This is worth carrying because you may become kettled or may stay late to support an occupation well beyond what you anticipated.

[ii] I'm really not trying to be anti-journalist in this book, but most journalists are not on "our side." Many are actively against us. Regardless, even well intentioned journalists can cause harm by revealing our identities.

Two-Way Radio

A two-way radio is a radio that can both transmit and receive a signal. Medic teams may choose to use these in conjunction with or instead of phones. Radios have the advantage of not requiring external infrastructure to operate. Large crowds can overload cell sites and prevent phone calls, SMS, or encrypted communications using mobile data from being sent or received. Radios have the disadvantage or being an additional cost and weight as well as requiring one for every buddy pair. The lack of encryption makes radio communication susceptible to interception, both for collection and real-time eavesdropping. Medic teams have reported poor range and signal clarity with basic two-way radios in the field in urban environments because of large buildings and in rural environments because of hills or dense forest. Radios should be field tested before they can be relied on.

Two-way radios are discussed in more detail in Chapter 35 ("Radio Operation").

Sunblock

Sunblock, also called sunscreen or suntan lotion, is a topical product that blocks a percentage of ultraviolet rays. Your sunblock should be water-based. Oil-based sunblock will cause riot control agent to bind to your skin. Your sunblock should be water-proof to prevent it from being washed off by your sweat, water cannons, or runoff from decontaminating patients. Your sunblock should be at least SPF 30.

Use of sunblock prevents skin damage and reduces the risk of cancer. However, the primary reason to use sunblock as a medic is that riot control agents will be more painful on sunburned skin.

Flashlight

Flashlights are useful for visibility while working or simply while walking as well as signalling in the dark. If your helmet has a build-in flashlight mount, you should acquire a light that mounts to it. Usually these lights have a shape that makes them useable as a handheld light when you are not wearing your helmet. These are also recommended as they do not require your hands to use. Chest-mounted lights that placed in a pocket or clipped to your bag are another hands free option. If nothing else, a small hand-held flashlight can be carried. Full-sized flashlights (the kind cops stereotypically carry) are excessively large and heavy, and they are liable to be confiscated by the police as a blunt weapon.

Glasses Case

If you wear corrective glasses, you should bring a hard glasses case to store your glasses. This is particularly useful while wearing a respirator and goggles, but you also may want to remove your glasses before you expect conflict to prevent damage to them.

Contact Lenses

As previously noted, corrective lenses are preferred to contact lenses due to increased incapacitation if riot control agents are deployed. You may want to consider bringing a pair of contacts lenses as a spare in the event your corrective lenses are damaged or if you have to remove your first pair due to contamination. You may also need replacement lenses if you are arrested and need to remove your lenses while jailed.

Clothing Choices

Choice of clothing depends a bit on the political climate where you are operating as well as your role. Discussion of tactical choice of attire is discussed in Chapter 32 ("General Tactics"). Weather should be considered as well.

In all cases, layering is recommended as if allows you to more precisely control how much you are insulated from cold, wind, and rain. Riot control agents bind to cotton, wool, and other natural textiles, but synthetic material such as nylon can melt to your skin as a result of coming in contact with explosives, other pyrotechnics, or burning tear gas cannisters. Layering allows you to wear both a heat resistant layer and a riot control agent resistant layer.

You should consider wearing thick cargo pants or shorts with many pockets, in particular work pants with velcro pockets. Likewise, specialty work vests for EMS personnel, hunting vests, and work vests offer many external pockets. Frequently used items should be placed in pockets with fasteners for rapid access as you will not want to constantly have to stop to get things out of your bag.

Other clothing items that tend to be useful are a neck gaiter or keffiyeh (also known as a shemagh or pali scarf). These are useful for warmth, to conceal your identity, and to protect your neck and face against sprayed riot control agents. Additionally, a keffiyeh can be used as a triangle bandage.

Some medics bring a change of clothing in an air-tight plastic bag to change in to in case they are contaminated with riot control agent. If you are operating in an environment where medics are classified as protesters and not as neutral caregivers, you may want to consider plain clothes for getting to and from an action to prevent you from detained before the action or arrested after. This takes up significant space and may be heavy. This volume and weight may be better served with additional medical gear.

31 : Packing Your Bag

> Every thunderstorm begins with a single drop. Try to be this drop.
>
> Lorenzo Orsetti[198]

The previous chapters covered a great deal of equipment in an attempt to provide discussion about most of the items medics carry to actions. You do not need to acquire everything that was listed in order to be an effective medic. Most injuries are minor, and a major part of being a medic is providing emotional care to patients (something you need no equipment for).

Knowing what to bring and what to leave behind is an important skill to develop. On one hand, you might be tempted to be prepared for every possible situation and overpack. On the other, you might think "I don't really need this" and leave important equipment behind. This chapter will discuss ways to balance what to bring to actions.

Avoid Posturing

When you are considering what equipment to acquire, consider whether you are making your choices based on what is the most useful for your goals or whether you are trying to become some idealized version of an Elite Riot Medic Warrior. Tacticool, a portmanteau of "tactical" and "cool," is a derisive term used to describe equipment that looks cool but serves no purpose. LARP stands for "live action role-playing game" which is a game where people dress up as characters and act out fantasy scenarios. Similar to tacticool, the term LARPing is used to describe the behavior of acquiring genuine equipment that one is unable to use because of lack of expertise of lack of a realistic scenario where it would be necessary. It is not uncommon to see tacticool and LARPing medics who have far too much personal protective equipment, are over-equipped, and yet manage to be wildly ineffective in their duties.

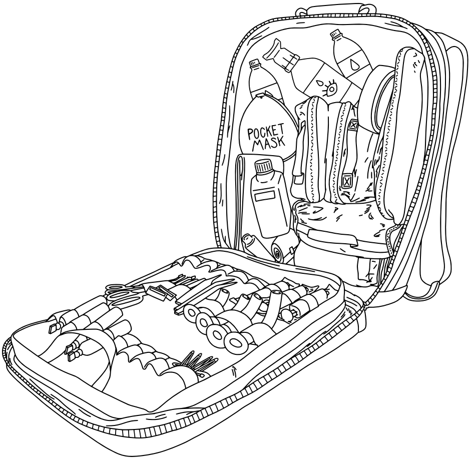
You do not need an abundance of equipment to be a useful medic. You do not need to impress anyone with your gear. Acquire a minimal amount of practical equipment to start, and acquire more as you need it. Don't be tacticool. Don't LARP as a riot medic.

Your Bag

Your medic bag should be something you can run and move quickly with. Simple backpacks or messenger bags are generally good choices. Bags that the worn over one shoulder may make it difficult to run. Carrying a bag in your hand is impractical and inadvisable.

EMS backpacks (Figure 31.1) typically have one main interior compartment, possibly with a large divider. They unzip all the way and open up like a clamshell so that their entire contents are visible and accessible at once. The equipment inside is divided into smaller pouches with clear plastic fronts so that their contents are visible. These pouches are usually color-coded and labelled to help a medics quickly find what they are looking for. Pouches are often divided into a single responsibility such as bleeding control or CPR.

Figure 31.1: EMS Backpack[12]



You do not need to acquire an EMS backpack, but your bag should attempt to emulate the features of an EMS bag. This style of bag is used by EMS around the world because it is effective at helping medics quickly render care. A school or hiking backpack plus a few pouches will typically suffice, and these can all be easily or cheaply acquired.

Using these features will make it easier for you to find what you are looking for, and moreover it will make it easier for your buddy or a bystander to help you find something. When your bag is well organized, you will know where everything is, and you can direct someone to hand you what you need by saying “Tourniquet. In the large red pouch.”

Commonly used items such as examination gloves, a few gauze pads, trauma shears, and medical tape should be easily accessible. Medics will often put these into vest pockets or use a small hip or waist bag. MOLLE-compatible equipment can be used with small pouches for commonly used items.

Clean Bags

A clean bag is a bag that never has anything put into it that you wouldn’t bring to an action. This may mean never putting weapons, recreational drugs, or private documents into it. As a medic, you may be stopped and searched, and you do not want to have forgotten to remove something from your bag. Use of a clean bag is a protection against accidents.

Even if it is illegal to bring weapons to a demonstration, you still may choose to do so for self defense. In this case, putting weapons into your clean bag doesn’t violate the rule because it is something you have chosen to do knowing the risks.

Having a dedicated bag for your medic gear is recommended in general. It makes packing easier since all of your gear is already packed from the previous action. Having a dedicated bag is a prerequisite for having a clean bag.

Packing Considerations

Your bag has finite space, so you will have to prioritize its contents based on what you expect to use.

Self care. You should always bring water and food for yourself. You cannot help other people if you become weak and exhausted from not eating all day. Your food should be in sealed containers or packaging to prevent contamination from riot control agents or body substances. Sunblock and extra layers of clothing may be appropriate depending on the weather.

Don’t weigh yourself down. You need to be able to keep pace with a moving action. This may just be marching all day, but it may also mean running, climbing stairs, and hoping fences. You will needlessly tire yourself out if your bag is too heavy. If you cannot keep up with an action, you cannot help anyone. Additionally, you are more agile with a lighter bag and this may help you evade arrest.

Take what you know how to use. If you have not trained with equipment, don’t bring it to an action. A stressful situation is the wrong time to learn to use new equipment. Leave it at home until you are comfortable using it.

Prioritize for common injuries. Common injuries are simple wounds (cuts and scrapes), dehydration, low blood glucose, and riot control agent contamination. Pack for these injuries first. Specialized equipment for less commonly seen injuries takes up space that is usually better used to care for patients you will more frequently encounter. What constitutes common will by region, expected opposition, and weather. For example, you may want to bring extra emergency blankets in cold weather.

Pack for many patients. Many actions require little to no medical support, but you may also have many patients on any given day. You should have enough gauze and bandages to treat multiple people.

Pack what you can afford to lose. While at an action, your equipment may be damaged, stolen, or confiscated. Consider the frequency with which police confiscate things from protesters before bringing hard to acquire or expensive equipment to an action.

Have eyewash easily accessible. Your eyewash bottle should be easily accessible so that you can self-treat in the event you get pepper spray or other riot control agents in your eyes.

Pack for known teams. Not every medic needs to carry a full loadout of all available gear. Generally one medic per team can carry a large bag with less common equipment, and each medic carries a basic bag with gauze, medical tape, and examination gloves in the appropriate size.

Consider omitting PPE. Not every action is going to be tear gassed, and a large respirator can be overly conspicuous and take up a great deal of space. For actions where you don't expect tear gas or significant pepper spray, consider sticking only swimming goggles and a filtering half-mask respirator in a vest pocket.

Example Bags

The following example medic bags are references to help make the guidelines discussed above a bit more concrete. Only medical supplies are covered in these equipment lists. A medic's own food, water, and other gear is assumed to be included.

Medic Light. The Medic Light kit is a simple medical kit that fits easily into a small pouch. It has only the basics to help with unexpected injuries at an otherwise uneventful demonstration. Medics attending actions where they are not actively on duty as a medic might carry this. Affinity groups may have a dedicated medic who carries a similar loadout.

Medic Standard. The Medic Standard kit is more comprehensive than the Medic Light. Medics who are less experienced might carry bags like this due to it lacking more advanced diagnostic equipment. Experienced medics might also choose to carry a bag like this if they are concerned with arrest and equipment confiscation in a repressed protest environment.

Medic Heavy. The Medic Heavy kit contains more diagnostic equipment than the Medic Standard kit as well as greater quantities and varieties of equipment for treating wounds. A bag like this is often carried by experienced medics or uniformed medics.[i] Due the size, weight, and total value of equipment inside, it is not recommend to carry a bag like this when there is high amounts of repression against medics. On a given team, only one medic needs to carry a heavy bag.

Packing List

The “Packing List“ tables contain the contents that would be carried in Medic Light, Medic Standard, and Medic Heavy bag. These loadouts are labelled by **L**, **S**, and **H** respectively. Quantities in *italics* are optional items.

Summary

The three fundamental questions to ask yourself when packing your bag are:

1. What do I actually know how to use?
2. What am I realistically going to need?
3. What amount of weight can I actually carry?

There are, of course, many other considerations, but if you can answer these questions, chances are you will be prepared for most injuries and illnesses you encounter.

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[i] Medics carrying a bag like this are likely EMS personnel and are certified to use more advanced medical equipment. These items were intentionally omitted.

Table 31.1: Packing List — Wound Care

L	**S**	**H**	**Item**
5	10	20	Individual package gauze (10 × 10 cm)
	5	10	Gauze roll 10 cm
	1	2	Non-adhesive dressing (10 × 10 cm)
	1	2	Roll 2 cm medical tape
		1	Roll 5 cm medical tape
		2	Elastic net dressing
	2	3	Self-adhering bandage (2 cm)
	1	2	Self-adhering bandage (5 cm)
	1	2	Elastic bandage
		2	Combat dressing
	1	1	Chest seal (pair)
	1	1	Package hemostatic gauze
	3	5	Package wound closure strips
10	20	20	Adhesive bandages (assorted size)
	1	2	Triangle bandage
	1	1	Tourniquet
	1	1	Burn dressing (10 × 10 cm) or burn gel (50 mL)
50 mL	50 mL	100 mL	Antiseptic spray
	50 mL	50 mL	Antibacterial creme
		400 mL	Antiseptic irrigation solution
		2	Irrigation syringe (30 mL)

Table 31.2: Packing List — First Aid

L	**S**	**H**	**Item**
	1	1	Trauma shears
1	3	5	Emergency blanket
	2	3	Instant cold compress
	1	2	Vomit bag
3	5	10	Dextrose & salt drink mix packet
2	5	5	Single-use saline vials
1	1	1	500 mL pneumatic eyewash bottle
	1	2	Tweezers
		1	Carry tarp
	1	1	Splint
		1	Cervical collar
	1	*1*	Can refrigerant spray
	5	*5*	Paracetamol tablets
	5	*5*	Ibuprofen tablets
	5	*5*	Aspirin tablets
	5	*5*	Anti-histamine tablets
	1	*1*	Salbutamol inhaler w/ spacer
	1	*1*	Epinephrine autoinjector
	1	*1*	Narcan spray bottle

Table 31.3: Packing List — Infection Control

L	**S**	**H**	**Item**
5	10	15	Pair Examination gloves
30 mL	100 mL	100 mL	Hand sanitizer
	1	2	Surgical mask

Table 31.4: Packing List — Basic Life Support

L	**S**	**H**	**Item**
1	1	1	Keychain CPR mask
	1	1	Pocket CPR mask (or BVM)
		1	Magill forceps
		1	Manual suction pump
	2	2	Disposable razors

Table 31.5: Packing List — Diagnostic Equipment

L	**S**	**H**	**Item**
	1	1	Pulse oximeter
	1	1	Penlight
		1	Stethoscope
		1	Blood pressure cuff
		1	Blood glucose meter (with lancets and test strips)
		1	Thermometer (with disposable covers)

Table 31.6: Packing List — Misc.

L	**S**	**H**	**Item**
1	1	2	Package tissues
	5	5	Tampons (assorted sizes)
	1	1	Roll black duct tape
	3	5	Plastic trash bags
	5	10	Pair earplugs
	5	10	Safety pins

Part IV

Tactics

32 : General Tactics

> There can be no separation of the revolutionary process from the revolutionary goal.
>
> Murray Bookchin[199]

In order to be an effective medic, it is not enough to simply learn medicine and have a well stocked bag. A medic must learn how to operate tactically during an action as well as within the political landscape of their region. In the field, doctors who are used to practicing medicine in a clinical environment may find themselves overwhelmed and ineffective when forced to work in a hostile and chaotic environment. Medics who draw the ire of the police or alienate allies may find that they are hindered in their ability to provide medical care for injured comrades.

The following chapters will discuss the tactics medics can use to effectively care for patients so that they can survive not just a single action but continue to operate over months and years. The tactics that will be discussed may not apply to you, and by attending a single action in your region, you will gain more specific knowledge than can be given here.

Neutral vs. Partisan

Left-wing protesters have two primary opponents. First are the police who break strikes, evict occupations, and beat the left clear a path for nazis. Second are the nazis, racists, and nationalists themselves.[i] Depending on your region and the competency of local law enforcement, one may be a greater threat to the left than the other. In some regions, police show up with overwhelming force to keep opposing factions separate, and a left-wing counter-protect must first fight their way through police lines before they can fight fascists. In other regions, police will either allow the left and the right to fight so they can pick off "violent anarchists" for arrest, or they are genuinely incapable of enforcing anything resembling so-called order. Of course, there is significant overlap in ideology between the two broad categories, and the police may explicitly coordinate with and protect right-wing extremists.

As a medic, there are many tactics you and your collective can use to avoid police violence so that you may work unimpeded. This principally relies on outwardly appearing to be a neutral medic rather than a partisan protester. This neutrality of actions can also shield you from right-wing vigilante violence while you are on the streets, though this protection is far less effective and reliable.[ii] To the extent it works, in a street brawl, one must pick out either the biggest threat or the weakest target, and medics are neither.[iii] Thus, this section focuses on how one can use the appearance of neutrality as a countermeasure to the State's repression.

Medic Classes

Traditionally, medics tend to divide themselves and others into two broad classes based on attire and tactics during an action. In Germany the terms red medic and black medic are used to distinguish these neutral and partisan medics, and in France, the terms rescuer and street medic have similar meanings.[iv] Based off my own experiences, there is some middle ground between these two categories that is worth differentiating.

Medics can be divided into the following three classes: uniformed medic, street medic, and black medic.[v] These aren't hard categories, and the tactics and attire may include some from other classes, but they approximately map to how medics are perceived by the police and media.

Uniformed Medic

A uniformed medic is a medic who dresses in an EMS uniform and refrains from active participation in an action. To someone on the sidelines, a uniformed medic should not appear to be a protester.

Attire. The most important factor defining a uniformed medic is, as the name suggests, the uniform. No amount of neutral actions will deflect police violence unless the uniform is nearly indistinguishable from the region's EMS. Uniformed medics should wear high-visibility pants, vests, and jackets with reflective strips. These are typically in neon orange,

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[i] And war-mongering neoliberals, among others.

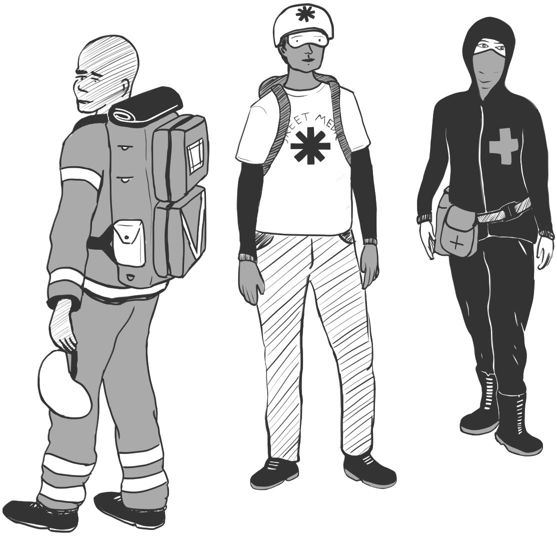
[ii] German nazis attacked kettled medics who were treating patients during the right-wing rioting in Chemnitz in 2018.[200] US nazis attacked and maced a medic who was treating a stab wound during the TWP rally in Sacramento, California in 2016.

[iii] This is a simplification, and medics may face fascists on the street in other ways beyond in street brawls. For example, being followed home after an action.

[iv] How common these are, I cannot say. Medics from those regions have told me this, and I assume it to be true.

[v] These are not widely used classifications, though they may be informally used by different groups. I had to come up with some convenient language for this chapter.

Figure 32.1: Medic Attire[9]



neon yellow, or red. An EMS backpack is helpful for completing the uniform, but it is not required.

There is significant difference in quality for high-visibility attire. The sort of of jackets and vests worn by cyclists or required to be kept in cars for emergencies look cheap and unprofessional, and this is obvious to most observers. Jackets and vests worn by EMS and construction workers are clearly more professional. While wearing them, to even a trained eye, you will be indistinguishable from traditional EMS. If you are part of a collective, acquiring matching or nearly matching uniforms heavily adds to the apparent professionalism and helps with this appearance of neutrality.

If you carry a helmet, it should ideally white, red, or in the colors of your region's EMS.

Medics are discouraged from using white lab coats as part of their uniforms. In many regions, these are strongly associated with or even reserved exclusively for physicians. Wearing one may be misleading. Blood also makes obvious stains against white fabric which make increase panic during an emergency. Many lab coats are not resistant to penetration by liquid. Scrubs are, however, entirely acceptable.

Actions. To maintain the appearance of neutrality, a uniformed medic does not actively participate in actions. This includes not wearing political symbols, not carrying banners, not chanting, and not actively engaging against fascists or the police. They may need to walk next to or behind a demo in order for the police to treat them as neutral. Unless there is widespread civil unrest, uniformed medics cannot fight cops, and unless they are attacked first, they cannot fight fascists.

If a collective has online or social media presence, they may need to pick a neutral name and use overly neutral language to help maintain this illusion. This may mean picking a name like "Metropolis Action Medical" over a name like "Metropolis Anarchist Street Medics." They may also need to keep the content of their posts neutrally toned. For example, they may be able to write posts critical of the police, but they should refrain from ending every post with ACAB and FTP.

Advantages. Uniformed medics are generally targeted by police less than other medics.[vi] They may be able to cultivate a cordial relationship with the police which may allow them to cross police lines and assist those who have been arrested. They may also be able to cross police lines to get to different parts of an action, and they may be able to enter and exit kettles.

Generally, uniformed medics are not searched, and, if so, not as heavily as other protesters. They are the least likely to have equipment confiscated. They also may be allowed to bring additional personal protective equipment to actions when it is forbidden for protesters to wear such equipment as it may qualify as a "passive weapon."[vii]

Uniformed medics can use themselves (more specifically, their neutrality) as shields to protect protesters from police violence. By standing in the way, they may be able to deter police charges or use of riot control weapons.[viii] In part, this depends on the presence of journalists[ix] who can capture police assaulting neutral medical support. Similarly, a uniformed medic refusing to stop rendering care to a protester and subsequently getting arrested can be powerful propaganda.

[vi] This does vary somewhat by region, and it seems to be the least true in the US where few (if any) medics use this tactic.

[vii] There was a case of this protection for medics being challenged in Germany. Following the arrest of a medic in 2016, a legal battle ended in 2018 that ensured that medics could carry their helmets.[201–204] If German medics didn't have an established neutral presence during actions, it possible they would have lost these protections.

Those who are less radical and new to protesting and social movements tend to place greater trust in uniformed medics. Fully uniformed medics are the most easy to identify in a crowd.

The appearance of neutrality can be used to form tactical alliances with various appendages of State apparatus to turn it against itself. For example, police watchdog groups and MPs may be more willing to offer legal support or publish documented cases of police brutality from a neutral group rather than a partisan group. Say what you will of such alliances, but having a MP who can keep police off medics' backs can be useful.

Disadvantages. The appearance of neutrality is difficult to maintain, and if this image is shattered, uniformed medics may again become impeded in their ability to provide care. It can be frustrating to not be able to de-arrest comrades, and it can be painful to have to stand idly by until police violence ends before you can begin care of patients. Polite professionalism with the police can be off-putting to members of your movement and participants of the protest.

If it is not common in your region to wear EMS attire, you may appear out of place and may arouse suspicion as you may appear to be a collaborator or agent of the State. You may also seem wildly uninformed about the nature of social movements in your region. There are also some actions where a uniformed medic comes across as overkill, and acting as a street medic makes more sense.

Another disadvantage of a uniform is a legal concept that goes by names like "scene safety." In short, this is the concept that prevents rescue personnel from being required to enter actively hostile situations until law enforcement can ensure that medical personnel will not harmed by dangerous persons. Scene safety is (generally) the legal concept that protects medical personnel from legal liability if they do not provide aid in such cases. Law enforcement may be able to prevent you from entering

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[viii] For an interesting example of this, consider the case of the 60-year-old Martin Friedrich Bühler who used his appearance as a clean-cut, old white guy to interrupt violence during the G20 riots in Hamburg in 2017.[205] It should be noted, however, that he does not have explicitly left-wing views (as suggested by some[206]). Much of what has been written about him[207] has been distorted by by a game of telephone leading to Bühler having mythic and more radical characteristics. In his own words, Bühler opposed violence on both sides.[208] Regardless, the key take away is that police understand the poor optics of attacking those society perceives as neutral or protected.

[ix] There are places in this book where I talk shit on shoddy journalists, but I truly believe that quality journalism is immensely important for social movements and antifascism.

an action if you are dressed in EMS attire even if you are neither certified nor a medical professional. Even if this is a concept in your region, it may be enforced at the whim of any given officer, so this may not always apply.

Less a disadvantage, but more a consideration is that fully uniformed medics are expected to have greater medical competency. Being unable to treat a patient or slightly panicking during treatment will seem grossly incompetent where as similar actions from other medics is more expected. Anecdotally, this can erode trust in medics' ability to provide medical care.

Misuses of neutrality. Some medic groups will provide aid to police and fascists, sometimes because they believe that medics have a moral obligation to be "truly" neutral, and other times with some vague hand-waving in the direction of the Hippocratic Oath. It will make it difficult for others to trust such medics, and, more importantly, it uses up finite time and resources that are better used for helping allies instead of enemies. Medics who do this are often derided by elements of the left as being apolitical and only attending riot to get up close to the action without caring about goals or ideals of any of the sides.

Others have said that they use these "true neutral" tactics as they feel this is the only way they can operate safely, and that it is needed to maintain the shield of neutrality. Choosing neutrality in this sense as a way to minimize risk is failing to show solidarity to those facing the brunt of State and police repression. Do not become a State collaborator to protect yourself. Do not throw others under the bus.

Street Medic

A street medic is an active protester. They are the "classic" and prototypical idea of a medic at a protest. Their differentiation from other protesters is that their focus is on providing care rather than actively confronting opposition. To someone on the sidelines, a street medic is a protester but not the main aggressor.

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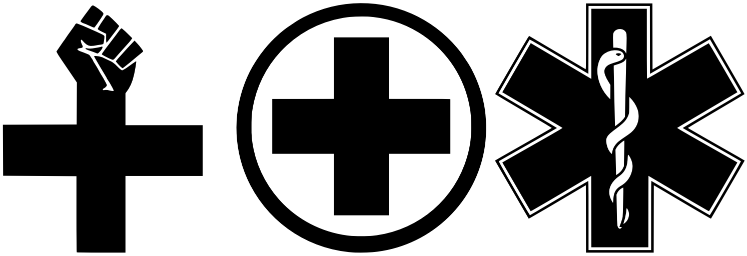
[x] Use of the red cross, red crescent, and related logos may be trademarked by your regional branch of the International Red Cross and Red Crescent Movement.[209] Their use without permission, even by unaffiliated medics, can lead to large fines. This is yet another reason to hate that organization. To avoid legal problems, some medics use green or blue crosses to identify themselves. Of course, you could always just use a black cross.

[xi] The symbol within this version of the star of life is the Rod of Asclepius, a single serpent wrapped around a rod. This is often confused with the caduceus, a winged staff with two intertwined serpents. The caduceus is staff held by Hermes that symbolizes commerce.

Figure 32.2: Medic Symbols



(a) Black Cross (b) Red Cross[x] (c) Star of Life[xi]

Attire. Street medics do not dress in EMS uniforms. They may still wear high-visibility vests, but more often, they wear t-shirts or jackets with large medic logos, either screen printed or as patches. They may wear armbands or helmets with medic logos. In short, the attire is often "street clothes, but with red crosses."

Actions. Unlike a uniformed medic, they can chant, carry banners, and display political symbols. They should generally refrain from actively attacking the police as this can taint police perception of all medics which may endanger others who attempt to rely on neutrality.

Advantages. The lack of self-imposed restriction on behavior feels more liberating and doesn't feed the cop in your head. Being able to intervene to de-arrest comrades or to help protesters may lead to less harm to protesters than acting neutral and only providing care after an injury has happened. Street medics are also not usually subject to scene safety restrictions.

Disadvantages. As a protest turns into a riot, street medics may lose the protections neutrality affords faster than uniformed medics. Likewise, this protection disappears as prolonged protest turns into mass unrest (such as in France with the Yellow Vests).

Black Medic

A black medic is a medic who has no or minimal markings and carries a small medic bag to assist with injuries. Black medics may be part of a affinity group or embedded in the Black Bloc to assist injured persons in kettles. They may also be stealth medics in plain clothes and not look like someone associated with the action. There are no self-imposed restrictions on a black medic's behavior.

Attire. Black medics should not dress in a way where they would be obviously considered to principally be medical support by an outside observer.

Black medics can regain some protection from police violence by keeping a light-weight, high-visibility vest in their medic bag. Donning this before beginning treatment of a seriously injured protester may help reduce the risk of police interference, and it will make it easier for other medical help to spot you in a crowd as they come to assist.

Actions. There is no restriction on the actions a black medic can take, nor any recommendation.

Advantages. This is the easiest class for new medics as there is the least expectation of care and professionalism, and it requires the least amount of gear, both medical and clothing. Black medics can embed themselves with the Black Bloc, and this allows them to provide support for radical actions where other medics would be too obvious. They can be directly on the front line and provide instant medical support in cases where other medics would need to stay further back to avoid being in direct fire or classified as "rioters."

Disadvantages. Black medics have no protection against police violence relative to other protesters. They may be heavily searched on the way to actions and have their equipment confiscated. Thus, they tend to be the least well equipped which can inhibit their ability to provide care. Further, because they are the least identifiable (or not identifiable at all) as medics, they must make the most active effort to seek out injured protesters.

Choosing a Class

Some medics may chose to operate under the cover of neutrality in order to maximize their effectiveness in providing medical care. They laud neutrality as realpolitik because it takes into account the fact that liberal democracies are more averse to radical displays of politics. Others find that neutrality is itself subversive because it leverages the concept of decency against the State that it is fighting. Some may oppose a lack of neutrality because it blurs the line between medic and "combatant" which may put medics at risk.

Those who reject the appearance of neutrality may be claiming ideological purity on the grounds that dressing in a way the State and masses find appealing is a concession to the superiority of the status quo. They may do so simply because they find street clothes more comfortable to don't want to spend money on a uniform when they could divert those funds to other more useful medic gear. Some medics will openly display their political leanings and refuse to allow themselves to be seen as neutral.[xii] Others disagree with the concept of neutrality as a capitulation to the State and a recuperation of radical politics. They may claim that rigid neutrality reinforces the idea that protesters are neatly divided into "good" (peaceful) and "bad" (violent).

This division between neutral and partisan is not entirely clear as the meaning is subjective to both members of the public as well as the police, and what constitutes neutral may be a moving or even unattainable goal. Some medics may find success in wearing uniforms and acting neutral. Others may find this has no effect on their ability to avoid police repression. This is something you must figure out for yourself as it varies by region.

At some point, this shield of neutrality will crumble.[xiii] As protest turns to riot, and continuous rioting turns to insurrection, the care the State has for maintaining even a semblance of a Lockean social contract will disappear. How fast this happens or to what degree will vary, and to rely on neutrality for indefinite protection is a sure way to get arrested. This protection may snap away for just a single weekend and return the next if there is a large gathering of politicians or other drivers of global capitalism. While in some cases it may protect you from the police, neutrality is even less effective against fascists, nationalists, and other right-wing groups.

This book makes no claim of the moral superiority for either neutral or more obviously partisan medics, nor is there a claim that any class of tactics is more generally effective than the others for advancing a movement.[xiv] The choice of how to operate depends on what a medic or collective is comfortable with or what they think is most effective for a given time and place.

Some medic collectives operate with a mix of medic classes, and what mix they have will depend on the nature of an action. A tactic that you may find useful is to embed black medics with the Black Bloc while some more neutral medics operate in other parts of the action. This allows partisan medics to immediately render aid to serious injuries and coordinate evacuation to treatment by the better equipped uniformed and street medics.

[xii] For there is no such thing as neutrality in the fight against fascism.

[xiii] In November of 2019 during the siege of PolyU in Hong Kong, police arrested 51 medics and journalists.[210]

[xiv] Personally, I operate as all three classes of medic depending on the action, region, and how rowdy I feel like getting. One doesn't need to pigeonhole themself into any single class of medic.

Solidarity

Each medic has their own personal ethics and politics, and a collective's politics are the sum of those of its members. To these ends, if a medic or collective chooses to support actions or groups, this support may be seen as an endorsement of the action or group's politics. In the struggle against capitalism, fascism, and the State, there are many factions. You may find some to be strong allies and other simply tactical allies given the current climate. There may be groups who you don't personally support even if they are working towards similar goals.

Some medics find that putting on a uniform removes some of their sense of individuality so that they may support actions they would not attend as themselves. Medics may choose to support a group they don't fully agree with because, in the current context, they are more ally than enemy. This may mean supporting a group who are targeted by neo-nazis even if that group has some problematic views. It may mean providing assistance to an action organized by soft liberals knowing that they neglected to organize their own medical support.

While we, the broader left, should show a large degree of solidarity to those we don't like or completely agree with, our own personal opinions may get in the way. We may additionally be burdened by rumors and accusations that come with whom we associate or appear to support. The donning of a uniform can be used to brush these off to some degree. Individuals and collectives can say "Our presence at an action doesn't imply support, and we are here to provide medical support for many groups."

In relation to dressing with neutrality, you may be granted additional privileges over other protesters. This may be permission to leave kettles early or to cross police lines to get to public transit or into a car park. Taking advantage of this may be necessary to do your duties, but you should avoid abusing this neutrality to serve yourself. Other protesters may become resentful, and leaving actions when others must stay lacks solidarity and may foster resentment. Whether or not this is an intentional police tactic to sew division is unclear.

Collect Statistics

Medicine should aim to prevent injury and illness as much as it aims to treat it. Epidemiology can help identify trends, and data can be used to influence policy.

The State, whether you trust it or not, can pass legislation that affect police behavior. You can influence the State, and if you can't do it directly, you can influence media and public opinion. Barring the abolition of the State and the police, what reform can be managed in the interim will prevent injuries, some of which are permanent, and loss of life.

Saying "the police beat a lot of people last week" is not a particularly convincing statement about police brutality. Unless said acts are caught on camera, and unless they are reported to the police, such incidents might as well be made up for all the weight they carry. Statistics and anonymous data gathered by medics can be compiled to show trends rather than just isolated incidents.

For an example of this, the Coordination Premier Secours ("First Aid Coordination") in France compiles data from medic collectives to create a census of the victims of police violence.[211] This information is publicized in documents including anonymized data as well as summaries. An example of their translated data from March 16th, 2019 can be found in Table 32.1 and Table 32.1.

Table 32.1: Patient Census Summary[212]

Weapon / Situation	**Victims**	**Of which...**
LBD40 / flashball	83	11 head injuries
GLI-F4 tear gas grenade	20	2 head injuries
Sting-ball grenade	50	12 head injuries
Tonfa / baton	37	17 head injuries
...	...	...
Total	**394**	**84 head injuries**

Table 32.2: Patient Census Data[212]

Victim 1	Man, 60's. Bruise on the back, shot by LBD40.
Victim 2	Man, 20's. Cardiac distress, unknown cause. Evacuation by firefighters.
Victim 3	Man, 30's. Large gash on the head, ankle wound, shot by GLI-F4. Evacuation by civil protection.
Victim 4	Man, age not given. Hyperventilation, loss of consciousness, tear gassed. Evacuation by firefighters.
Victim 5	Woman, age not given, medic. Wounds on the back of the thighs from exploding GLI-F4.

If you choose to collect data on this, you should coordinate with other medics as well as legal observers. Useful data points to collect are, in some semi-order of priority:

- If the patient was a medic, journalist, legal observer, or other non-protester
- Nature of the injury or illness (location, description)
- Cause of the injury, especially noting whether or not it was caused by the police
- Treatment given
- Whether the patient required evacuation to advanced medical care
- Exact location such as cross street or landmark
- Exact time
- Photo of injury, sufficiently anonymized
- Patient age, bucketed to decade (e.g., child, teen, 20's, 30's, etc.)

Gender is of questionable utility to collect. Data you should not collect are name, exact age, or anything else that could be used to identify the patient. Additionally, you may need to check with local laws about collecting patient data and how to sufficiently anonymize it for reproduction.

Know Your Enemy

In order to better understand police tactics, it may not be enough to actively observe them at demonstrations. This may be helpful, but you should talk to other activists and medics in your region to share knowledge. Read police manuals and browse their forums to see what they talk about and how they think.[xv] Watching videos online of police actions can also be useful, especially those of actions you have attended. This gives you external data to compare what definitely happened to what you subjectively experienced. Such footage can be truly enlightening.

Preparation can help calm you by giving an idea of what to expect. When police charge into a crowd, do they leave medics alone? If so, you may be able to back against a wall and wait it out. Do they beat and arrest everyone with zero regard as to what they were doing? If so, you will know to expect no leniency.

[xv] The 2016 film *Do Not Resist* covers the 2014 Ferguson unrest and gives introductory insight to how the police act and think. While it is true that the US is hyper-militarized, and it's also true that police tactics vary from region to region, there is still insight to be gained.

As with all left-wing social movements, there will be attempts at infiltration from the State and fascists.[xvi] There may additionally be snitches.[xvii] You will have to develop some security culture, which is somewhat covered in Chapter 34 ("Operational Security"), but identifying and outing snitches is out of scope of this book.

Further, you will need to be aware the not all medic groups have a left or even centrist outlook. While it is generally less common, right wing medic groups exist. At counter-protest and liberal actions, they are of little concern. During larger, more widespread unrest, they will try to pollute a movement, and they need to be driven out.

Summary

It may be possible for you and your collective to present as a neutral and unaffiliated group by carefully branding yourself and dressing like a medical professional. This, plus a pleasant disposition when interacting with the police, may make it possible to act unhindered while at actions. This is especially useful for crossing police lines, avoiding arrest, and being able to treat patients with out police intervention. Acting and dressing neutral is no guarantee that law enforcement will respect you as a medic, but it may help. There are some drawbacks to dressing and acting this way, and you may have political and ethical qualms with giving the appearance of respecting the State or showing anything but utter contempt for the police. It is not strictly better to act neutral or not, and you and your collective will have to decide how you generally behave.

[xvi] Starting in 2004, "Anna the medic" worked as an infiltrator leading to the 2006 arrest of green anarchist Eric McDavid and two others.[213,214] Anna used her position as a street medic as an in to groups, and when called upon utterly failed to provide aid leading to at least one hospitalization. Anna is fucking scum.

She was not the first, and has not been the last. In 2012, Seattle anarchists spotted another informant posing as a medic.[215]

[xvii] An antifascist medic known as Tan was discovered to be a police informant in 2016 in Portland, Oregon.[216] Tan was so shameless in their snitching that they wore a medic patch for the photo shoot for the article about their snitching. They claimed to want to relocate to the Berkeley or Seattle protest scenes, completely misunderstanding the damage they caused or that they would not be trusted.

33 : Action Tactics

> Crises precipitate change.
>
> Deltron 3030, *Virus*

A key difference between clinical medicine and riot medicine is that in a clinical setting, patients arrive to the doctor in a stationary, well equipped, and controlled environment. This contrasts to medics who need to seek out patients and may be intentionally or incidentally blocked from being able to provide care. In this sense, the practice of riot medicine shares many characteristics with both lifeguarding and combat medicine.

In this chapter, actions are loosely split into two categories with no defined boundaries. This is done to help talk about the tactics that make sense at actions that are generally more peaceful and generally more confrontational. For our purposes, these are called demonstrations and riots respectively. This isn't claiming that organizers or attendees always start an action with the explicit intent of having a more reserved action or a more rowdy one (some may have goals and other may let things develop organically), and this isn't claiming that actions always neatly fall into one category or the other. Actions may begin as one, transition to the other, and then back again as the day goes on, and as such, your choice of tactics may need change too.

Coordination

In Chapter 2 ("Organizational Structures"), there was some discussion about organizing within the local community and with other medics and collectives as a means of effectively providing medical care. Long-term planning and continuously attending actions helps build familiarity and repeatable habits so others know what to expect from medics, but more specifically there are certain way medics should coordinate with others at every action.

First, medics should check-in with the organizers or major groups at an action. When medics make a habit of checking in, organizers will know that medics are or are not present instead of medics' presence seeming random. When organizers and other groups know that medics are in attendance, they will know to seek them out should someone require assistance instead of waiting for traditional EMS to arrive.

When you check-in, you should ask if there are other medics present so you can speak with them. This will allow you to coordinate your positioning with them to provide better coverage of the event as well as having an idea of how they are equipped and what their competencies are. You are encouraged to work with other collectives as this will facilitate knowledge sharing as well as solidarity. Members of different collectives are encouraged to work closely with each other at actions.

As part of coordinating with organizers, groups, and other medic collectives, establishing a means of communicating is important. This may mean exchanging phone numbers or setting up a temporary group chat using an encrypted messaging app. Rapid coordination over large distances can be extremely helpful, and organizers are often informed of injuries which they can then relay to you.

Forming Teams

During actions, there may be more medics than you and your buddy, and it may be advisable to split into teams. Having ten medics all at the same location generally does not make sense. Spreading medics across the length of a march or across an action increases the chance that medics will be able to promptly reach patients. This is of particular importance if the area is large, there are multiple places where violence may break out, or there a chance that police or opposition movements or tactics could partition the action into multiple disjoint groups.

Because medics should not operate alone, teams should be at least two medics. In general, only three medics can treat a patient at the same time, so with allowance for one spotter, teams should have a maximum of four or five medics. Generally, teams of two or three seem to make the most sense since other protesters can be recruited as spotters or to provide protection, so allocating one slot for someone dedicated to this job tends to be unnecessary. Once a team grows to six, it typically makes sense to split it into two teams of three to provide better coverage.

Friendships, interpersonal relationships, and minor disagreements over politics can give rise to natural formations of teams, but assuming all medics are able to get along, the dividing of medics into teams should generally be done around experience in riots, medical qualification, athleticism, and tolerance for risk. Some guideline are as follows:

- Place medics with more experience at riots on teams with medics

with less experience at riots to they can ensure good positioning as well as team safety.
- Place medics with greater medical qualifications on teams with medics with lesser qualifications so the highest number of teams can perform certain procedures (e.g., the use of adjuncts for advanced airway management).
- Place medics who are more athletic on the same team so that if part of an action begins running, at least one team can match the pace.
- Place medics with greater athleticism on to separate teams so they can be the "pack mules" who carry the majority of the equipment to prevent tiring out less athletic medics.
- Place medics with similar tolerances for risk on teams together so that no one is pressured into more dangerous situations than they are comfortable with.
- Place medics with similar PPE on teams together so that no member of a team faces increased risk of injury during any activity (e.g., all team members have helmets).
- Place medics who have to leave early on teams together to prevent their departure from breaking up teams or leaving anyone alone or unequipped.
- Increase teams sizes when actions are expected to be more confrontational or violent to provide safety in numbers.
- Decrease team sizes when actions are expected to be peaceful or stationary to provide better coverage.

It is not possible to follow all of these guidelines as some are directly contradictory. When considering which guideline (if any) to use for splitting teams, it is useful to discuss with your collective how they think the day's action will play out. Example scenarios are provided below. They are hypothetical and meant to illustrate how one might assign teams, and when reading them, you should not assume all actions will play out like what is described here.

Example 1

A local civil rights group has arranged a march through downtown, starting at a park and ending at city hall. The march is expected to have only light police presence based off similar actions in the past and the posts made by the local police department's Twitter account. This is confirmed by the medics when they arrive. An estimated 10,000 participants are attending. There are six medics present: 1 nurse, 1 EMT (basic), 2 more experienced medics, and 2 less experienced medics.

As sensible arrangement would be to make three teams. The nurse and EMT each pair up with the one of less experienced medics, and the two more experienced medics pair with each other. Should it be needed, the nurse and EMT can fully render care in most situations, and the less experienced medics can learn and receive guidance. The more experienced medics may have less medical knowledge, but because they are experienced, they are unlikely to panic should they encounter injuries or illnesses that are more severe than they know how to handle.

Example 2

Fascists from around your region and beyond have converged on your town following some perceived injustice. Because of the rapid mobilization by the far-right, police presence is minimal. Antifascists and liberals are counter-protesting the spontaneous demonstration, but are outnumbered. The attendees are 3,000 fascists, 200 police, 400 antifascists, 800 liberals, and 5 medics of varying skill level.

The medics analyze the situation and coordinate with the radicals to see what they plan on doing. Because there are so few police, the risk of the action partitioning because of the police is low as is the risk of kettling. The medics determined that the main risk is not violence between police and the antifascists, but between the fascists and the counter-demonstrators. Most antifascists do not plan on directly engaging with the fascists because they will be protecting the liberals who were not expecting a fight.

The medics decide to stick to one team of 5 because the action is small enough and there is too great a risk of violence. They will provide roaming coverage around the liberal participants since they are less accustomed to violence, and any hot engagements between antifascists and fascists will likely be too dangerous for medics to be immediately useful.

Clustering

A natural tendency is for people to cluster with friends and comrades, and medics are no exception. When you see other medics you know at actions, you may be tempted to hang out with them or walk with them. It is recommended that you avoid prolonged time with other medics as this decreases coverage and changes the focus to socializing instead of scanning the crowd and making continuous tactical assessments. The larger risk is that actions may become partitioned by the police. If the medics are clustered, they may be cut off from parts of the action, and people may be left without medical support.

Medics are human too, and there is the need to relax a bit even while at demos. Being "on" all the time can be draining, and the previous recommendation against clustering is said strictly from a tactical perspective. When it comes to providing care and being aware of your surroundings, socializing in large groups can be counterproductive.

Scouting

Related to coordination with organizers and other medics collectives, having strong connections to local comrades allows you to recruit scouts and spotters at actions. Scouts can be useful for medics to notify medics of demonstrators' tactics that might trigger a response from fascists or the State. Scouts may be members of the Black Bloc, journalists, or more casual protesters. Scouts are useful as they do not require any medical training, and they can operate with less of the restrictions of neutrality medics might self-impose. If you work with scouts, it is generally useful to have them relay to you the following information:

- The location, movements, and strength of police, fascists, and friendlies
- The presence of blockades and whether they were placed by the police, friendly demonstrators, or opposing demonstrators
- The position and size of kettles
- Locations where there are incipient or current confrontations
- Any injuries including location and severity

You may not be able to always react to all this information, but it can help you prioritize what situations to attend to as well as give an overview of what is happening during an action. Use of scouts may be particularly useful if the police inhibit medics' movements during actions, especially if the action is large.

Positioning

Knowing where to be can be challenge to providing medical care. If you cannot find patients, or if you cannot reach them, you will be unable to help them.

At Demonstrations

During demonstrations, most injuries and illness a medic treats will not be trauma from confrontation with the police of other opponents, but from the environment or the individual's inability to adequately take care of themself over the course of the day. You will typically see heat exhaustion, hypoglycemia (diabetic or otherwise), dehydration, nausea, and general feelings of unwellness. With this in mind, the position of medics is best done more akin to how lifeguards position themselves while watching a pool. Medics should attempt to maximize coverage over the main body of the demonstration.

Maximizing coverage may mean teams that are only two medics instead of the slightly larger teams of three or four that might make more sense at actions that are more confrontational. These teams should stagger themselves along alternating sides of the march route or around the body of a stationary demonstration. During a march that does not appear to be confrontational, medics do not need to be directly at the head since there is unlikely to be conflict and they are better placed a bit further back where they can see more of the body of the march. It is also useful to have one team of “sweepers” at the end to catch stragglers who are exhausted or may have fallen during the march. If an action is stationary, medics should periodically walk through the crowd to scan for unwell participants. Medics also should be mindful to not only look ahead but to frequently check behind them and away from the main body as injured or ill persons may move far to the sides of the main route in search of shade or a place to sit.

Unless it is unsafe or unpermitted, medics should generally position themselves on the sides of crowds instead of in the main body. This is done to give increased visibility into the crowd.

During marches, medics may have a tendency to walk too fast and bunch up at the front of a march because the sides are relatively clear. It is a good practice to pick a fixed group or banner in the crowd and use it to keep a steady pace.

At Riots

For actions that are expected to be more confrontational, or as a previously calm action moves towards confrontation, how medics should position themselves becomes more complex. It requires greater understanding of the area, police tactics, friendly tactics, and opposition tactics. The basic question your collective should ask is: what do we think is going to happen and where?

Route. Is this a march or an even that has a known (public or private) route? What is that route? How long will it take to traverse the route? Do radicals plan on deviating from the public route? If the route deviates from the known route, the police will likely intervene.

Has this route been used before, and are there points where conflicts have happened before? Are there choke points along the route where protesters will be forced into close proximity with with the police? These may lead to confrontations.

Points of interest. Are there major points of interest that may lead to conflict? For example, police stations, monuments (including both those supported and opposed by the action), memorials, or buildings that may be the target of property destruction. Will the action take place in a neighborhood with racial, ethnic, or national divisions?

With non-state opposition. Is your action the counter-protest? If so, what is the route for the main protest? Answer the previous questions but from the opposition's point of view. What are the start and end points of their route? The start and end of both your action and theirs tend to be locations of conflict. Will your protest attack the other protest or vice versa? Will anyone form blockades? Where will these be? What is the typical police response to blockades? Being present at a blockade made by comrades is useful as there tend to be injuries when they are cleared out.

Arrival and departure. Both your arrival and departure points for an action, as well as those of your opposition, are places of potential conflict. Opposing sides may attack each other at these locations, and those protesting against fascists at these locations may be attacked by the police. You may need to arrive early and stay until the end to ensure all protesters, even those fighting to the bitter end, can receive care.

Mood. What is the mood of the action? Is is calm or are there radicals looking to fight the State? Is this a recurring action such as May Day that is known for being conflict heavy? Actions may start violent and then lose energy throughout the day, or they may start comparatively calm and then gain momentum as they go on, climaxing into a street brawl with cops. Having a sense for the mood of the will help you decided how close to radicals you need to be.

Radicals. Is there a group of radicals or a Black Bloc? The Bloc is a both a source and sink of violence at actions. The police will target it because they can "get away" with beating rowdy anarchists in the public eye, and likewise the Bloc is often interested in fighting police and fascists. Being adjacent to the Bloc makes it easy to quickly render care, but if you are not sufficiently distinct from the Bloc, you may become a target yourself.

State tactics. What sort of police tactics do you expect for the day? What sort of forces will be out? Uniformed cops, riot cops, water cannons, horse mounted police, bike police, motorcycle mounted police? Have cops like this been deployed before, and what happened when they were? Is kettling a tactic? Do the police attack bystanders or is it limited to protesters or even just the Bloc? Are medics targeted by the police, or are medics relatively safe? The more medics are targeted, the more they should try to stay with the main body of a protest.

Helicopters. Are helicopters deployed? During an action, if you are unsure where to position yourself, you may want to consider making your way directly below them. Helicopters are often above points of conflict or potential conflict.

Stay late. In addition to staying late to provide care at departure points, police may look to pick off lone groups of protesters or antifascists after an action is "officially" over. You may need to stay late to help these individuals, though this may make you a target yourself. Note that if you are uniformed, police may treat your continued presence as an escalation in so much as you encourage protesters to stay longer and get rowdier while support is still there.

At the Action

Once you have a general idea of how the day might play out, positioning is often done by answering these simple questions: where will there be violence, and how close can I safely get to it?

Some general rules that are helpful for positioning are as follows:

- Be present at large blockades
- Be near the counter-protests at the start and end of fascist marches as there may be violence as counter-protesters try to disrupt the march before it begins or fight them after
- Be near the front of a march or near the Bloc (often the same place)

You will need to be close enough to the activities to not be cut off or kettled, preventing you from reaching patients. However, kettles themselves may be something you want to be in if you have reason to believe there are injuries in the kettle, something that is often true if the police are acting violently toward protesters. You may not be able to enter a kettle, and once in, you may not be able to leave. Letting yourself get kettled is generally only advisable if you know there are other teams who can continue roaming.

Voluntarily Kettled - Anonymous

Following days of rioting by neo-nazis, we were out in service again for a left/liberal counter demonstration. On this night, there were multiple teams present, some we knew well, and some we were only loosely coordinated with.

Almost immediately, the radical elements of the left moved towards where the neo-nazis had gathered and ended up in fights with cops who were protecting them. Cops in riot gear, horse mounted cops, and vans quickly pulled up and drove the Bloc back into a commercial plaza where some 150 people got kettled.

My team had the opportunity to stay out after the kettle had already closed, and we discussed whether we should go in too. We knew there were other teams out in the city, and we weren't sure if there would be any patients for us to help or even ones that we would be able to find. We'd already seen cops beating protesters and rocks flying, so we guessed that there were injured comrades in the kettle. With the camouflage of respectability from our professional looking uniforms, we were able to talk our way in and get to work.

Two patients required ambulances, but the police wouldn't let the EMS personnel through to evacuate them. Luckily, one of our comrades was a certified paramedic and was citing legal code at the cops and writing down their badge numbers until they conceded that we could do the evacuations. EMS was able to do their job, and without us there, the patients probably would not have gotten the medical attention they needed.

We were stuck in the kettle until late into the night, but even though we missed the exciting "action," it was the right decision to join the other protesters in the kettle.

Movement

There are some guidelines about movement to keep in mind while acting as a medic.

Walk, Don't Run

When moving at an action, a general rule is to avoid running or jogging when no one else is. Anyone running at a demo can incite panic, especially if they are highly visible and seemingly official like medics may be. Is the person running because of police violence? A vehicle attack? A knife attack? What ever the case is, running can make people uneasy, especially if you are in a uniform because the implication is that you have a very good reason to be running.

In most cases, if you you must move fast, walk quickly. This gives you time to collect information about what is happening. Running will usually only save a couple of seconds over most distances, and as you learn how to position yourself, you will find it becomes less and less necessary to have to move more than a few tens of meters to reach a patient. Further, not running makes it easier for a team to sick together. One team member taking off in a sprint to reach a patient leaves the rest of the team behind. When you move more slowly, you move together.

There are some clear exceptions to this, such as the presence of danger that you must avoid or if the action you are supporting is running and you must keep up. Teams may need to move through choke-points or police lines before a route closes. Often this is a quick scurry as police start to create a kettle or block off a street, but sometimes this might mean sustained jogging to get a head of a large police presence that is sequentially blocking off all access to a street, park, or other waypoint.

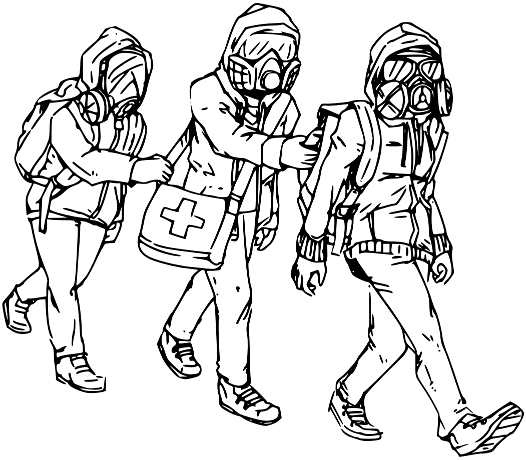
In a Crowd

When moving through a crowd, it is very easy to become separated from your team. This can be through simple inattention or accidentally being cut off by the movements of the crowd itself. The priority should generally be to keep the team together, not to reach the destination quickly.

Teams should move in a line with one person acting as a trailblazer to find a path through the crowd and everyone else following in the path they've created. The trailblazer has the responsibility of ensuring they are moving at a manageable pace, avoiding abrupt path changes (to a reasonable degree), and avoiding moving through tight spaces that might separate the team. Those following have the responsibility of not losing the person in front of them. Everyone, including the trailblazer has the responsibility of not losing the person behind them meaning they should frequently check that no one behind them has become separated.

To keep the team together, firmly grab a strap or handle of the bag of the person before you. Feel for the tension or weight on your bag from the person behind you. If you lose your grip, shout for the person in front of you to slow down. If you feel someone lose their grip or hear them shout, pull on the person in front of you and relay that the team needs to slow down. For an example of this, see Figure 33.1.

Figure 33.1: Moving as a Team[217]



Search and Rescue

Ill or injured protesters may not be aware that medics are present or they may be unable to find them. To get aid, they may call EMS themselves. When EMS arrives, they may not be able to locate the patient in the crowd, and medics may be recruited to help find the patient.

This is a time when it is appropriate for medics to split up from their buddies in an attempt to cover as much ground as possible. Coordinate with EMS on how to search. Ensure that whatever search pattern you decide on covers all the ground and doesn't extend unreasonably far from the expected location of the patient. Get as many details from EMS about the patient as possible including a physical description as well as symptoms. A patient with a broken collarbone may be standing and otherwise appear well, and a patient who is suffering from heat stroke is probably on the ground and in the shade.

Before you and you team break up, pick a rally point in the event you are unable to find each other after finding the patient. One option is meeting at the ambulance that EMS arrived in. If the patient is evacuated, the attending medics can follow them back to the ambulance and meet the other medics. Major landmarks are also a useful option.

Typically a search takes under 5 minutes, so medics who have not found the patient after thoroughly searching their area should move to other areas in an attempt to regroup with other medics. This is useful because it allows teams to reform and move on to assist the action in other ways instead of waiting until the one patient has been fully assisted.

Be Where Help is Needed

It may seem obvious to say “be where help is needed,” but often medics will make several mistakes and do what feels right over what may actually be useful. They may have positioned themselves in the correct place, namely where there is violence between protesters and police or fascists, but surging violence may cause them to be unable to effectively render care.

Much of this is following instincts that must be manually overridden. This can be done by constantly asking one’s self “What do I do if the police surge? What do I do if our side attacks? What do I do if we are attacked?” Without an answer to this question, your first reaction may not be the most effective.

Stay with the wounded. When the protest breaks through a police line, your instinct may be to keep running with the group. If police do not target medics, or if you are willing to risk arrest to render care, you should stay to help injured protesters. Immediately stopping or quickly moving may be dangerous as people behind you may hit you. Ease to the side and slow down, then double back to look for people to help.

Don’t over-retreat. When there is a wave of police violence, either through a charge or a volley of rubber bullets or tear gas, you instinct may be to run until you are safe. Instead, consider only retreating just far enough to be out of direct fire. Keep an eye out for protesters on the ground and pressed up against buildings for cover. You may need to stay to help and evacuate injured protesters.

Too many cooks in the kitchen. When someone becomes injured, it is common for all present medics to rush over. This quickly leads to an over-saturation of medical care where everyone wants to feel like they’re helping. Sometimes this is useful as it means there will be people present who know to form a wall and help protect the medics who are attending to the patient. However, medics should attempt to recruit non-medics to act as protection to free themselves up so they can look for and help other patients. It feels good, brave, and bold to link arms and stand around while someone treats a patient, but in many cases the medics don’t need protection and the gesture is purely performative.

Keeping a Low Profile

Part of being a medic is avoiding becoming a focal point for either police, fascist, or friendly attention. This may mean slightly altering your tactics from what is ideal for providing care to what is more useful for the goals of an action.

Don't Draw Attention

As a medic, you may be well connected to the inner workings of the local anarchist or antifascist scene, and hence you may have inside knowledge about non-public actions or non-public tactics that will be used during actions. If you typically mark up or are one of a minority of people with a large backpack at actions, the police will recognize you. Thus, you being a part of an affinity group that is carrying out a non-public action may cause the group to lose the element of surprise.

If a group you know is planning an action or planning to use tactics during an action that require secrecy, you may have to give that group space to allow them to carry out their operation in secret.[i] At a large action, you may be able to position yourself somewhere where you can quickly move to support comrades, and for secret actions, you may be able to dress in street clothes and wait in a near by cafe until after the action has started.

It is important to remember that while a medic's job is to support action and provide care, that care should not get in the way of the actions themselves. Medics need to remember that those partaking in an action have the agency to decide to engage in potentially risky activities, and insisting on providing care when it may be counterproductive to the action's goals can be paternal and infantilizing to the participants.

During actions, you may want to avoid pointing at individuals, at groups, or in the directions of group movement as this may be seen by the police and used against the participants. You may know what is going on and have eyes on the entire scene, but as a medic you might not be in a position to direct the group, and you don't want to give away information.

Avoid Escalating

You may have significantly more protective equipment than other protesters as this is "allowed" by the police because medics may not be considered protesters. The importance of safety has been mentioned numerous times in this book, so you might suspect that medics are encouraged to always wear a helmet and have their respirators slung around their necks. This is inadvisable as police may interpret it as either an escalation or a warning sign that the protest is about to turn violent. Similarly, participants in the demonstration may see you fully prepared for violence and become uneasy as they suspect you know something they don't.

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[i] This is the second St. Paul Principle.

At most actions, if the police do not have helmets on, you probably don't need to wear one either. Even if one bottle is thrown or one firecracker is set off, you may still want to leave your helmet off since other participants may look to medics for cues about how they should act. For your respirator and goggles, you probably shouldn't don them until after tear gas is deployed the first time (though they should be easily accessible).

Maintaining Vigilance

Staying safe during an action isn't simply a matter of medics wearing personal protective equipment and carefully positioning themselves. It is also an active effort to be aware of their surroundings even when the action appears to be at rest.

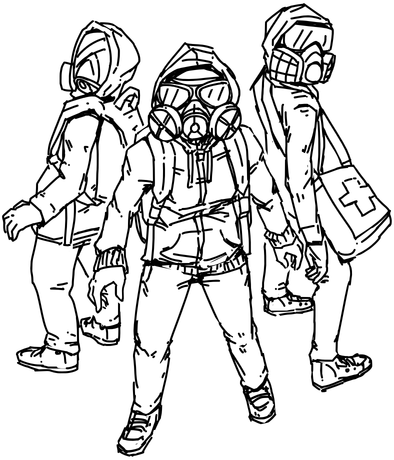
Medics should be aware of police and fascist presence. If you are walking at tail end of a march, you should frequently look behind yourself to check that the sweeping police line is not closing in on you. If it is, you may need to join the main body instead of walking behind it. If you are on the sides of an action, groups of riot police may be walking around quickly and will knock people out of their way or snatch them for arrest. Beware of groups of riot police quickly moving up beside you.

If an action is standing still, it is useful for medics to stand back-to-back in a circle so each medic is looking in a different direction (Figure 33.2). This is sometimes called a diamond formation. When doing this, collectively the group has no blind spots. This allows the medics to survey the entirety of their surroundings for patients as well as police or fascist movements. However, this tactic may appear overly militaristic and may make people uneasy if used at actions where there is little to no chance of police violence or where there are no riot police present.

Summary

It is exceedingly difficult to make statements about how any single medic or collective should act at an action. Many of the factors one must consider are region specific. While this chapter may not have been able

Figure 33.2: Diamond Formation[217]



to give you hard rules to always follow, some of the advice generalizes to many situations. If all of this information were to be summed up, it could be be:

1. Be safe, be alert.
2. Move towards where you expect violence.
3. Don't let a surging crowd pull you away from your duties.

34 : Operational Security

> Silence means security.
>
> WWII Anti-Rumor Propaganda

Operational Security (OpSec, sometimes OPSEC) is the process of preventing useful information from being gained by an adversary. In the context of riot medicine, this means things like preventing your identity from being discovered by the State or ideological opponents or preventing the route or location of an action from being discovered in advance by law enforcement.

OpSec is not simply a set of actions you take during an action that protects you. It is a way of thinking you apply to all aspects of your life. OpSec is also not an individual undertaking. Your personal security depends on the security of your comrades and vice versa. This is often called “security culture.”

The definition of OpSec is more formalized in the contexts of military and espionage, and in those cases it tends to have the explicit focus on only protecting information. In colloquial usage among anarchists and activists, it tends to be broader and includes the adjacent fields of information security and physical security. This is a natural extension of the original definition since a significant amount of secret information is transmitted digitally, and a breach of OpSec may have immediate physical security ramifications.

An entire book could be dedicated to modern OpSec and another entire book could be dedicated to current information security practices. This chapter only serves as an overview that covers enough basics to help prevent medics from making the most major of OpSec errors.

Threat Modeling

Threat modeling is the foundation of OpSec. It is a methodology used to identify threats, and through this identification, inform mitigations against them. Threat modeling is not a checklist that someone can give you to reduce your risks or ensure your adversaries cannot achieve their goals. Threat modeling must be done analytically on a case-by-case basis. The process of developing an individual threat model is similar regardless of the person doing the threat modeling, but the resultant threat model is highly personalized. The basic vocabulary of threat modeling is defined in Table 34.1.

Table 34.1: OpSec Vocabulary

Term	**Definition**
target	a person or group who may be subject to scrutiny, repression, or espionage
asset	something a target may want to protect such as information, physical items, or intangibles like their own liberty, mental health, or bodily health
adversary	a person or group who wants to learn about, capture, or destroy a target's assets
goal	a specific task or outcome an adversary wishes to achieve
capability	knowledge, a skill, or an item an adversary has that they may use against a target to achieve their goals
vulnerability	something an adversary could exploit or leverage in pursuit of their goals
threat	the combination of an adversary with their goals and capabilities
attack	a possible threat that is executed
risk	a combined measure of how likely a threat is to occur and how severe the outcomes would be if it did occur
mitigation	an action taken to reduce risk

You are likely familiar with threat modeling and have already used it in your day-to-day life even if you have not done so formally. Making this decision to keep your phone in your pocket and not message your comrades while you walk home at night is threat modeling. You have recognized that the threat of mugging or assault exists in a certain area, that this risk is higher at night, and that you are less likely to be targeted if you are visibly paying attention to your surroundings.

A threat model might exist for you in your life as a medic, for your affinity group at large, or for a single action. You threat model will need to change with time as the threat landscape and your own tolerance for risk changes. The political climate may become more repressive, or you may start a family and need to reconsider what possible consequences you and your family can endure.

To start building your threat model, start by identifying your assets, possible adversaries, their goals, and their capabilities. Helpful questions might be:

- What do I care about?
- What do I want to protect?
- What objectives am I trying to achieve? And how?
- Who might prevent me from achieving these objective? And how?
- How have similar people with similar objectives been thwarted or arrested?
- If an adversary's attack is successful, how can I limit the damage done?

Threat modeling is an iterative process. As you ask yourself these questions and write down their answers, you will be able to think of additional threats. Talking to your comrades may help you identify threats and vulnerabilities, but remember that your comrades' threat models are not necessarily your own.

One you have enumerated the threats, consider the risk associated with each. How likely is it to occur and what are the consequences if it does? These are estimates and meant to help you prioritize which threats need to be addressed first. Threats that have severe consequences but are extremely unlikely might still be ranked as low risk. Threats that are moderately likely with only moderate consequences might be ranked as high risk. Go with you gut when assigning risk and prioritizing the threats.

Once you have listed your threats, consider different mitigations against them. Some mitigations might cover multiple threats at one time, or you may need many mitigations to cover your highest priority risks. A mitigation may not fully remove a threat or reduce the risk to zero. Mitigations are meant to decrease the amount of risk you face. In addition to thinking about how effective a given mitigation may be against a threat, also consider if you are likely to follow through with this mitigation. A mitigation that you are incapable of executing is not useful.

As you threat model, you may start to feel that perfect security is an impossible goal, and as a result you might as well give up. This is called security nihilism: the belief that because security cannot be "perfect," any amount of security should be forsaken. Rid yourself of the belief that you are either "secure" or "insecure." There is no such thing as perfectly secure. There is simply a state of being more secure against certain threats and less secure against those threats. Your goal should be to improve your security, not make it ironclad against all threats.

Lastly, your threat model needs to account for random chance. You may have incredible adept online security, and you may always cover your face and tattoos at actions. Nevertheless, you may have bad luck and have the same daily commute as a detective investigating local activists.

A Simple Example

Imagine you live with flatmates and you have just baked some cookies to take to a party later. You want to make sure you can give them to your friend at their party later in the day. What do you do?

The Threat Model

To start, you might ask yourself how could the cookies end up in a state where you cannot bring them to a party. If the cookies are eaten, you can't bring them to a party. They might go stale. They might become damaged or dirty so no one will want to eat them.

Who might eat the cookies? Your flatmates, their friends, or a household pet. Ants might want to eat them too, but they won't eat much of the cookies so much as they will render them inedible to most guests. A bird might fly through an open window and steal one.

The cookies might go dry if they're left uncovered, or your house might burn down and destroy the cookies with it. While you're transporting them, the cookies might get damaged by the weather or fall on the ground.

You decide that the best mitigation for all these threats is to put them in a covered tray and leave it in your room until it's time to go to the party. This addresses the threats that are most likely to occur and does so in a way that doesn't take an intrusive amount of effort.

Conclusion

This example is intentionally silly, but through its simplicity, you can see that you already know how to threat model and come up with a mitigation plan for all sorts of things in your life. Applying this to your insurrectionary life is similar but only requires more research on threats and mitigations.

Additional, and more importantly fun, reading on OpSec can be found under the tag "PopSec" (a portmanteau of "pop" and "OpSec"). PopSec uses pop culture as a didactic device to teach lessons about operational security. See the CrimethInc. website[218] or *Totally Not Malware*[219] for further reading.

Tips for Threat Modelling

When considering your or your collective's threat model, looking at the FBI's program COINTELPRO (Counter Intelligence Program) can be illuminating on how law enforcement attempts to undermine activist organizing. This program was localized to the United States from 1956 to 1971, but such tactics continue to be used globally. In a letter dated August 25th, 1967, the FBI director at the time, J. Edgar Hoover, wrote the following:[220]

> The purpose of this new counterintelligence endeavor is to expose, disrupt, misdirect, discredit, or otherwise neutralize the activities of black nationalist, hate-type organizations and groupings, their leadership, spokesmen, membership, and supporters, and to counter their propensity for violence and civil disorder.

Additional resources to use while estimating the capabilities of law enforcement is to look at indictments and legal transcripts for arrested and prosecuted activists. This will hint at how evidence was gathered and tied together. Keep in mind that these may be not be perfect representations of the truth as law enforcement may use parallel construction to build cases against individuals or groups. Parallel construction is using illegal sources of data, such as mass surveillance, to find evidence and then attributing it to traditional, legal detective techniques.

Finally, ensure you speak to other local activists about how they have been detained or apprehended. You may learn simple pieces of advice on how to bring equipment into a protest without being stopped and searched.

A Riot Medic's Threat Model

It was said before that each person's threat model is unique to them, but there are shared elements that apply to many individuals. This section will list some common threats and their mitigations. Remember that it this threat model may not apply to you. It is here simply for illustrative purposes.

Targets and Assets

The targets you may want to consider are yourself, your comrades, friends and family, your collective and its members, and the other organizations you work with and their members. The assets you may try to protect are your health, freedom from imprisonment, anonymity, the privacy of your social and activist networks, the continued smooth operations of your collective and the operations of the organization you work with, and the medical and protective equipment you need to do your job.

Adversaries, Goals, and Capabilities

You adversaries are typically local law enforcement, state or national law enforcement, activists of competing or opposing ideologies, snitches, and informants.

Law enforcement's goals are to prevent crimes from occurring, protect capital, maintain the status quo, and to generally disrupt left-leaning activist organizing. This done through the application of force and legitimized violence, arrest, discrediting activists and movements, the imprisonment of individuals and members of targeted groups, and legal fines. Their capabilities include the ability to conduct investigations and surveillance; the legal right to stop, search, arrest, and interrogate individuals; and the ability to imprison and even execute activists. These capabilities may also include access to digital communications or the data gathered through mass surveillance.

Members of competing or opposing ideologies or groups have goals of winning over public opinion over your ideology, taking over or replacing the current government, and disrupting your and your organizations' abilities to organize. They may additionally have the explicit goal of killing you in an attempt to establish their idea of an idealized state. Their capabilities may be to gather intelligence and share it with the police; pressure officials to make statements about your group; doxx you in an attempt to disrupt your personal life; hack or break into your online accounts; harass you online; and inflict violence on you, your friends, or your family.

All your opponents have the ability to use OSINT (open source intelligence) to gather data via social media and other data aggregators.

Vulnerabilities, Threats, and Mitigations

The primary threats you face as a medic are being doxxed (either by law enforcement or opponents), having your equipment confiscated, being arrested during actions, and having an action's plans discovered in advance by law enforcement.

You are vulnerable to being doxxed primarily by your social media accounts and the existence of public records. In some countries, public records are scraped and published, and they may list information like your full home address, email addresses, phone numbers, and license plates. Even if you have no social media accounts or public records, your family members' or roommates' social media accounts or public records may still identify and locate you. The main threats of doxxing is the social pressure that can be used to get you fired or evicted as well as the threat of physical violence from opponents knowing where you live.

The mitigations against doxxing by opponents is to delete social media accounts, become anonymous on social media, or use separate accounts for your personal and activist lives. Paid services exist that scan for and remove public records. Deleting old content on accounts and fully deleting old accounts reduces the volume of data that exists online that can be used to identify you. Even if these measures are taken, if you are arrested, police may publish your name, age, and partial address, even if you are not charged with crimes.[221]

Law enforcement may have directives to search all participants of actions and confiscate things that could be used to thwart police efforts. Attempting to bring contraband to an action may lead to arrest. During actions, police may target medics for arrest because removing one medic may effectively remove many tens of people who would not be healed and returned to conflict by that medic. Likewise, medics may be targeted intentionally because of the psychological blow it would be to their comrades for seeing "neutral" individuals assaulted and kidnapped.

Mitigations for avoiding detainment, arrest, and item confiscation before an action may be to dress as plain as possible while approaching a rally to not draw attention to yourself. You may choose to arrive ahead of expected police presence, though this may leave you a sitting target. You may also choose to approach an action but not join it until it has started and the police are busy or on the move. Avoiding arrest at demos may involve travelling in slightly larger numbers. This raises the cost of attempting to arrest you by increasing the chances of conflict. Conversely, travelling in larger numbers draws more attention. Befriending journalists and staying in proximity to them may prevent you from being targeted as law enforcement may understand the negative optics of attacking medics on camera.[i]

Law enforcement may compel you to make statements or testify against your comrades. In the United States, this may be done as part of a normal investigation or the more insidious grand juries. Whatever the method, you may be charged and imprisoned for failing to turn over information or making false statements. A helpful guide for how to talk to police is provided in Figure 34.1, though more succinctly the answer is "never."[ii] Beyond finding a competent lawyer, one of the St. Paul Principles for organizing that was mentioned in Chapter 2 ("Organizational Structures") is non-cooperation with law enforcement. Comrades can build a wall of resistance against investigation by collectively agreeing to stay silent, thus thwarting law enforcement's attempt to exploit the Prisoner's Dilemma.[iii]

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[i] Again, many of these tactics of shielding yourself from police brutality only work to a degree, and the extent to which they work diminishes as actions become more riotous and lean towards insurrection.

When it comes to actions themselves, medics need to be wary of inadvertently leaking information about an action to the press or law enforcement. Medics may want to be close to parts of actions that are most likely to be involved in conflict, but police may use the presence of medics as an indicator of tactics. If an affinity group or collective plans on taking action that has both a need for secrecy and a high chance of conflict, a mitigation against leaking these movements is for medics to dress plainly or stay away until the police are already aware of the conflict. Social media might be a great way to spread word about actions, but it is monitored, and anything posted could give away the location or time of an action as well as the position or current participants in an action. Medics should also remember to cover tattoos and other identifiable features.

Possibly one the most damaging pieces of information to be learned by law enforcement or fascists is your name. A simple mitigation of this is using so-called "demo names," or a name you only use at demonstrations. This should be different than other aliases you use for activist work to avoid tying your different identities together. Random, short names (1 to 2 syllables) that can be easily shouted and understood are particularly

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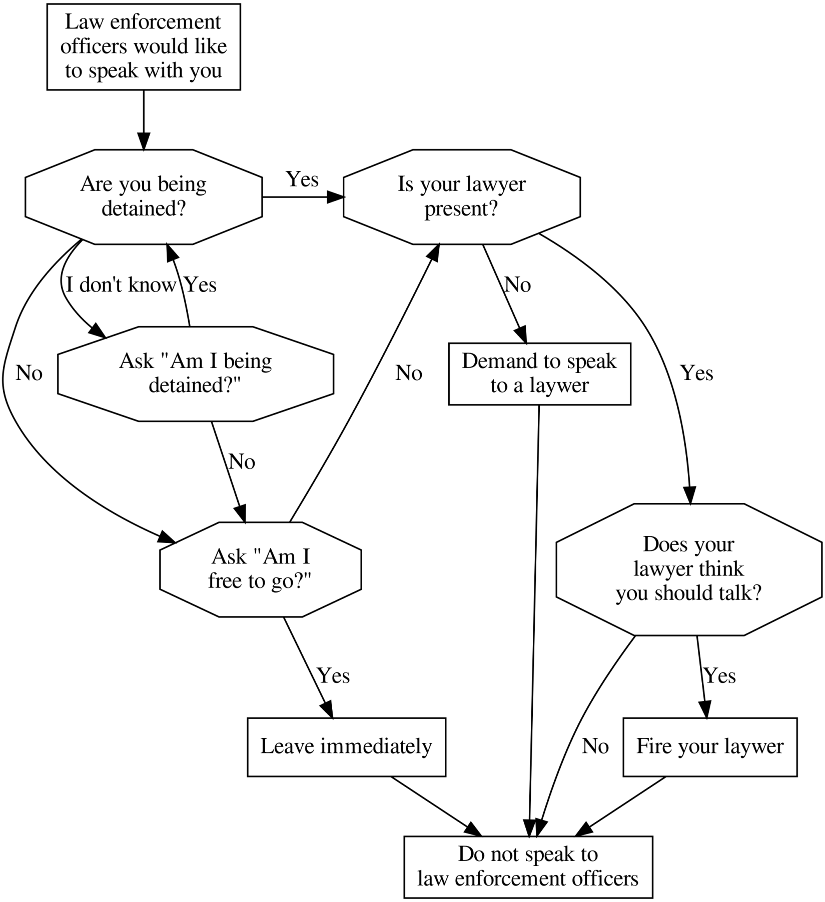
[ii] Note that the provided flowchart was created by an individual living in the US. The exact steps may vary, and you may supplement them by asking "what law have I violated" or "under what powers are you holding me?" Elevated police repression may render this useless as the State is the entity the grants you civil liberties, and the State can just as easily revoke them. Further information can be found on the Netpol website[222] and the Green & Black Cross website,[223] though you should find equivalent organizations in your region as this information may not apply to you.

[iii] The Prisoner's Dilemma is as follows. Two individuals are detained by the police. Both may snitch or stay silent. If one snitches and the other stays silent, the snitch goes free and the other goes to prison for 3 years. If both snitch, both go to prison for 2 years. If neither snitch, both go to prison for 1 year.

Thus, morality aside, both are inclined to snitch on the other for self preservation. The strategy of non-compliance guarantees minimal punishment for both parties (not to mention the real world consequences of preventing other comrades from being caught up in the ensuing dragnet).

Figure 34.1: Talking to Police[224]


Law enforcement officers would like to speak with you
Are you being detained?
Yes
Is your lawyer present?
I don't know
Yes
No
Ask "Am I being detained?"
No
No
Demand to speak to a laywer
Yes
Ask "Am I free to go?"
Does your lawyer think you should talk?
Yes
Yes
Leave immediately
No
Fire your laywer
Do not speak to law enforcement officers

useful. It can be difficult to remember to only use your comrades' demo names during actions, and an easier alternative is to more commonly use non-legal names with each other.

Digital Security

Digital security is a fast moving discipline, but the reality of the modern world is that some amount of understanding of how governments and corporations perform online surveillance is necessary for activists to operate.[iv] The prevalence of technologies and apps wax and wane, and even practical pieces of advice for a given app may become irrelevant after an update or UI change. If you are reading this book even a couple of years after it was written (2020), you may need to find equivalent technologies as the specific applications listed here may be outdated.

The Internet

To understand how to safely browse the internet, you need to have some understanding of how the internet works "under the hood," otherwise you will just end up uncritically memorizing arbitrary steps. The internet is built on abstractions, and much of the complexity is hidden behind interfaces that aren't exposed to users. Most people understand that their web browser or an app connects to a server somewhere to send and receive data, but they often don't understand how their device knows what server to connect to and how to get the information there.

The internet is a network of networks. The devices in your home share a local area network (LAN) to communicate with each other. This LAN is connected by a gateway device (your router) to the rest of the internet, also known as the wide area network (WAN). The internet connects your LAN to other LANs and devices and allows you to send and receive messages.

Information is sent in the form of packets using IP (Internet Protocol). You may already be familiar with IP addresses, a sequence of numbers identifying a location on the internet. The IP address commonly assigned to the router on a LAN is `192.168.0.1` (IPv4) or `c0a8:1::` (IPv6). IP packets consist of a header that contains a source and destination IP address (among other metadata) and a payload. Because every IP packet contains the source and destination addresses, every device that relays a message to its destination can see who sent what packet to whom.

[iv] The 2017 film *Nothing to Hide*[225] is useful for showing how digital security matters for everyone, not just activists.

Information sent over IP is typically done using TCP (Transmission Control Protocol) or UDP (User Datagram Protocol). Because TCP is so closely tied to IP, they are collectively referred to as TCP/IP in many cases.

The domain name system (DNS) is a naming system for devices on the internet. It allow us to translate human readable domain names like `riotmedicine.net` into IP addresses so packets can be routed. DNS servers typically have fixed IP addresses (e.g., `9.9.9.9` or `8.8.4.4`). DNS servers contain mappings between domain names and IP addresses and are queried by your devices. DNS queries are done using IP, so every device between you and the DNS server can see what domain names you have requested.[v]

Web applications, and especially browsers, use HTTP (Hypertext Transfer Protocol). HTTP is a text based protocol that sends information over TCP. HTTP by default is insecure (unencrypted) and all devices between you and the destination server can read or modify the request and response. Encryption can be added to a TCP connection by using TLS (Transport Layer Security). HTTPS is HTTP that uses a secure TLS connection. Modern browsers typically show a red, open lock icon in the address bar for HTTP connections and a green, closed lock icon for HTTPS connections.

Encryption, including TLS, provides three properties:

1. **Confidentiality**: the message can only be read by its intended recipient
2. **Integrity**: the message cannot be altered
3. **Authenticity**: the message genuinely came from whoever claims to be sending it

Encryption does not provide anonymity. Who sent what message, to whom, at what time, and the size of the message are still visible. Additional measures are needed to provide anonymity. As to why this is important, just ask Michael Hayden, the former director of the NSA and the CIA, who said "We kill people based on metadata."[226]

A Single Web Request

A typical use of the internet is using a browser to access a view a web page. To help make the previous content more clear, an example request with all its steps is listed below.

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[v] With DNSSEC, queries and responses are encrypted, but at the time of this writing, DNSSEC is not widely deployed.

1. A user types `https://riotmedicine.net` into the address bar of their browser and hits enter.
2. Their device makes a query to a DNS server to get the IP address of `riotmedicine.net`.
    (a) Their devices sends a UDP request over IP to a known IP address of a DNS server.
    (b) The DNS server responds with the associated IP
3. Their browser makes an HTTPS request to `riotmedicine.net`.
    (a) Their browser opens a TCP connection to a server located at `riotmedicine.net`.
    (b) Their browser negotiates a TLS connection via this TCP connection with the website running on the server located at `riotmedicine.net`.
    (c) Their browser makes an encrypted HTTP request through the TLS connection to the server, and the server responds.

When going through this example at the time of writing, there were 7 devices between my laptop and the DNS name server used to look up `riotmedicine.net`. There were 11 devices between my laptop and `riotmedicine.net` (4 of which were the same as the DNS request). This means that 15 devices in total were able to infer that I was connecting to `riotmedicine.net` at a particular time. The only part of any of the requests that was encrypted was the TLS connection, and that only encrypts the content of the request and response. The DNS look up, TCP connection, TLS handshake, and metadata about the TLS connection (total volume of data sent, at what rate) are all visible to intermediate devices and network observers.

A network observer is a term for an abstract actor who can monitor your network traffic. This may mean a device that logs traffic as it routes it, someone watching unsecured WiFi traffic, or a government. Governments may tap cables directly,[227] or they may request real-time traffic logs from an ISP (internet service provider).

Traffic Anonymization

Depending on your threat model and what sort of activities you are engaging in, you may want to consider anonymizing your internet traffic through various means. Possibly the largest reason to do so is if you are accessing websites controlled by fascists or the State as part of your research for upcoming actions. You likely want to hide your true IP address to avoid associating yourself with any actions.

VPNs

A VPN (virtual private network) can be used for a number purposes, but for usage by activists it is typically used to change the source IP address of internet traffic. VPNs work by creating a “tunnel” to a proxy server and sending internet traffic through this tunnel. This proxy server then forwards the traffic to the actual destination so that the destination server only sees the IP address of the proxy server.

A VPN can offer protections against certain kinds of attacks and information disclosures, but it does not guarantee anonymity. Use of a VPN can protect your traffic from your device to the WiFi router you are connecting to in order to protect your traffic from being observed or manipulated while you are on public WiFi. Use of a VPN will prevent servers you connect to from knowing your true IP address, but they may still be able to identify you by other means such as tracking cookies. If the VPN proxy server is not in your country, and none of the servers you are connecting to are in your country, it may be impossible for a nation-state level actor to identify your traffic (but this is not guaranteed).

A VPN has drawbacks too. The fact that you are using a VPN is, in most cases, easily observable. VPN use may be illegal in your country, and even if it is not, use of one may single you out for additional scrutiny. Additionally, you need to place a high amount of trust in your VPN provider to not manipulate or log your traffic or cooperate with law enforcement.

As a note, there are free VPNs that exist to help users easily stream video that is geo-fenced and unavailable in their region. These VPNs typically come in the form of browser extensions. They are not secure and should not be used as they may be poorly implemented and likely are profitable because they monitor and sell your data.

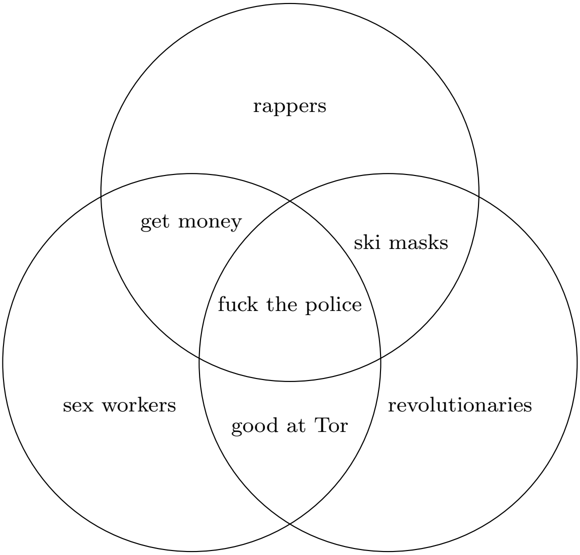
Tor

Tor, run by the Tor Project, is more specifically designed for anonymizing traffic than VPNs. Tor (short for “The Onion Router”) uses volunteer run severs to relay traffic between sources and destinations[vi]. Traffic is encrypted multiple times and routed through three servers (known as a guards, relays, and exit nodes). By doing this, no single server has enough information to identify both the source and destination of any traffic. Most users do not use Tor as a proxy directly, but they use the

Tor Browser.[vii]

Tor has similar pros and cons as VPNs. Use of Tor is noticeable by a network observer and may be illegal in your region. Using Tor Browser makes you much more likely to be anonymous, but it is not a guarantee that you are anonymous.

Figure 34.2: Shared Characteristics



Safe Browsing Habits

In addition to ensuring the transmission of your data is secure (and possibly anonymous), you should be wary of the websites you use. Some websites may be actively malicious, and others may simply passively log your visit. Refraining from downloading and opening files from suspicious sites is generally good advice, but also not entirely practical. You may need to download a list of names of the attendees of a rally, or someone

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[vi] This is specifically called "onion routing" as one can imagine messages being multiply encrypted and decrypted like the layers of an onion. Hence, Tor's logo being an onion. Onion routing is a type of mix network (though some argue Tor *isn't really a mix network* [but I digress]).

[vii] Tor Browser is a modified version of Firefox that proxies traffic through the Tor network.

may send you a document with tips. Consider finding a comrade who is competent to help you ensure such files are safe.

It is commonly said that "the cloud is just someone else's computer," and while there is some debate to the truth of this, it is a useful reminder that data stored in the cloud may be accessible by employees or may be turned over to law enforcement. To these ends, storing data for your collective in the cloud in unencrypted (or even encrypted) storage may be dangerous to you and others. While less convenient, you may be safer planning things over encrypted chat.

Secure Messaging

So far as information security goes, secure messaging is probably the most important for medics, and luckily is is also the easiest to use correctly. Like with other discussions about OpSec, use of the following technology may not make sense for your individual threat model. If you are unsure about this, do your own research and talk to local activists who are security experts.

Secure messaging is based on public key cryptography. The basics are that each party generates their own key pair consisting of a public and private key that are mathematically linked. The parties exchange public keys, and then use each other's public keys to encrypt messages to each other. The weakest link is the exchange of the public keys. This is usually facilitated by a remote server, so manual verification that the correct public key was received needs to be done by each party.

This verification is done to prevent a man-in-the-middle (MITM) attack. Imagine Alice and Bob want to exchange keys, but Eve wants to intercept their messages. Eve creates a fake key pair for both Alice and Bob, and when they two targets attempt to exchange keys, Eve gives them the fake public keys. Alice encrypts a message to the fake Bob key, Eve decrypts it, reads it, re-encrypts it with the real Bob key, and sends it to Bob. In this case, it is impossible for Alice and Bob to know that someone is reading messages between them.

To verify the keys, a number is mathematically derived from the parties' public keys. Different apps use different methods. Some will generate a single number that is a combination of the two public keys, and both users will have the same security code. Other apps will generate a number for each public key. In this case, Alice will show her key's fingerprint to Bob, and Bob will check that the fingerprint for Alice on his phone matches. Alice does the same for Bob's fingerprint.

This check needs to be done in person, and if there are mismatches it may mean there is a man-in-the-middle. If there are warnings in the future about new keys or unknown signatures, you will need to reverify their keys.

Messaging Apps

There are many chat apps, some of which offer encrypted messaging. Depending on your threat model, you may want to use to the most popular app in your region because it doesn't draw attention and the government in your region isn't able to compel the creator of the app to turn over your messages. For example, using WhatsApp or Telegram for messaging may make the most sense because of their popularity.

For a messaging app to be trusted as secure, it should be open source software[viii] and use end-to-end (e2e) encryption. E2E encryption means that the server that relays the messages between users can be mostly untrusted since it can't read the messages, though metadata about who is talking to who is still visible. Some messaging apps only use in-transit encryption where the messages are only encrypted from user to server and server to user, but their contents are readable on the sever. These should generally be avoided.

The app Signal has e2e encrypted messages and phone calls but requires a phone number for registration. It offer group chats with e2e encryption, making it useful during actions. Riot (which uses the Matrix protocol) is another option, but its lack of forced e2e communications makes it a less ideal choice. There are more niche options like Ricochet (which hides metadata) and Briar (which can work on a LAN or with Bluetooth), but for most medics their use may not be necessary.

GPG

GPG is an application that implements the OpenPGP standard and allows users to encrypt files and messages.[ix] There are graphical user interfaces for GPG that are somewhat user-friendly as well as plugins for use with email clients. GPG is notoriously complex and difficult to use correctly even when using other helper tools. It has significantly weaker security properties than messaging apps that implement end-to-end encryption. Unless it is absolutely necessary, you should avoid using it. Because of its complexity, discussion of the proper usage of GPG and related technologies is outside the scope of this book.

[viii] Open source software means that the source code is available so it can be audited for correctness and a lack of backdoors.

[ix] You may be familiar with GPG because of it's prominence in the story of Edward Snowden's 2013 global surveillance disclosures.[228]

Updates

Software, operating systems, and devices should be always be immediately updated. Software updates aren't just about making apps prettier or fixing bugs. They often include important security updates. New exploits are constantly being produced and discovered. MITRE listed 15,054 common vulnerabilities and exposures (CVEs) in 2018 alone,[229] and this is not including the countless more found in smaller or closed source applications that were never reported.

Passphrases

Passphrases are the main security measure that protects online accounts from unauthorized access. Strong passphrases that are sufficiently random prevent an adversary from guessing the passphrase. Passphrases should not be reused because it would allow an adversary who guesses one passphrase or uses social engineering to learn it to reuse it across many accounts. When a website is breached and data is exfiltrated, adversaries will attempt to reuse passphrases across all accounts associated with the username or email address. The website *Have I Been Pwned?* maintains a database of credentials that have appeared in data breaches.

It is infeasible for the average person to memorize unique, random passphrases for every account or website they use. Passphrase managers like KeePass, 1Password and LastPass allow users to choose one strong master passphrase for their passphrase "vault," and then automatically generate random passphrases for all of their accounts. Everyone should use a passphrase manager for all of their online accounts.

Humans are not adept at creating the kind of randomness required for strong passphrases, and generally passphrases that are random enough are difficult to memorize. Diceware is a method for generating random, yet easy to memorize passphrase. Diceware involves selected words from a pre-generated list and concatenating them into one passphrase. An example Diceware passphrase is `correct horse battery staple`.[230] Diceware passphrase lists are available in many languages. The original English language Diceware list,[231] published by A. G. Reinhold, has many "words" that are difficult to memorize. A revised Diceware wordlist put out by the Electronic Frontier Foundation (EFF) is more amenable to memorization.[232]

Phone Security

There are many urban legends around phone security, especially in regards to burner phones. For our purposes, there are three fundamental types of phones: an everyday phone, a disposable phone, and a burner phone. It should be noted that for all of these types, there is no requirement that any be a smart phone or "dumb phone." Phones that can only make phone calls and send SMS messages are not necessarily more secure against most threats, and they do not inherently offer any anonymizing properties.

An everyday phone is one linked to your identity containing personal data and accounts. This phone is linked to your identity either by SIM card and mobile contract or location data. This is the phone you use when communicating with friends or comrades, and it probably contains photos, calendars, and other highly personal data. You may have multiple everyday phones such as one for personal use and one for work. You may choose to split multiple aliases across multiple phones to help with isolation of online identities, but because these phones are all on your person, it is assumed that law enforcement could link them to your physical address and legal name.

A disposable phone is a phone, usually cheap, that is used if it has a high likelihood of falling in to law enforcement's hands. Disposable phones are often used when traveling abroad and crossing borders. Border agents may require the phone to be unlocked for search before being allowed entry, and the State may install malware on it during this process. These phones contain only the minimum amount of information needed to achieve the user's goals. When travelling, this may mean only a single, disposable email account used to communicate with friend. For actions, it may mean a single secure chat app with only a few contacts added. Compartmentalizing this way minimizes the impact of them being searched, and because they are cheap, the user is more willing to throw it away after, thus mitigating efforts of the State to spy on activists.

Finally, there are burner phones. Colloquially, many activists and anarchists use the phrase "burner phone" to mean a non-smart phone that they take to actions. This is incorrect usage of the phrase. A burner phone is a very particular type of phone that must meet the following criteria:

1. The phone must be purchased using cash
2. The SIM card used for the burner phone must be purchased using cash
3. The phone and SIM card must be purchased by a user with no other phones or traceable devices on their person at that time
4. The phone and SIM card pair must only be used with each other

5. The phone must never be taken to locations associated with the user unless it is both off and in a Faraday bag.
6. The phone must never be used in the presence of non-burner phones or other devices that can be tracked back to the user.
7. Any accounts on the phone must be made anonymously and only ever used with that phone.
8. The phone must be used for exactly one action.
9. The phone must only ever contact other burner phones or unaffiliated parties (e.g., an office or opponent who is targeted by the action).
10. The phone and SIM card must be destroyed after the action.

If any of these are violated by any parties involved in an action, location tracking and network mapping can potentially identify the entire group. Even experts in this field make mistakes. In February of 2003, an Egyptian cleric was kidnapped by the CIA in Milan, but the mistakes made by the CIA agents eventually led to the indictments of 25 suspected CIA agents and 5 high ranking SISMI agents.[233]

There are very few cases where you need a burner phone, and if you do, it may be better to use no phone at all. This is especially true as a medic where you will likely not be involved in the kind of extremely risky activities that require that level of anonymity.

As a medic, it may be sufficiently safe for you to carry your everyday phone to actions. If you are not involved in planning of illegal activity, there is little on your phone that is damaging (aside from comrades' contact details). A disposable phone you use only for demos may also be useful to minimize this type of data leakage.

Generally, having a phone for maps, real time intel, and communication outweighs the risks. However, as the political situation in your region becomes more repressive, being identified by your phone may make it too risky to bring it.

Faraday Bags

A Faraday cage is an electromagnetic isolation enclosure, though the details of how they work are not important. Small Faraday bags can be purchased for phones, IDs, and metro cards. This will prevent detection of the RFID chips in IDs or other types of cards, and they will block cell phone signals. Together, this significantly reduces the likelihood of these devices being used to identify you while at a protest. If may be not reasonable to leave these items at home, and if you need to bring them to a demo, a Faraday bag offers protections. Note that using a metro card to travel to and from an action may circumstantially place you there even if it is in a Faraday bag during the action.

Summary

Medics should create personal and collective threat models to guide what security measures they will use to counter State and fascist efforts to identify and disrupt their activities. Typically using secure messaging apps, careful use of social media, and refusing to talk to the police is sufficient to stay safe, but as social movements transition from protest to insurrection, the amount of security one needs in their life increases. Having realistic security practices that can actually be followed is more important than having impossibly complex and unwieldy protocols that significantly impair one's ability to actually carry out their work. Medics should be cautious of security dogma such as "never use a smart phone" that do not offer meaningful increases in security.

35 : Radio Operation

> What is needed is action – action!
>
> John Brown

Use of two-way radios is not typically needed for urban and suburban actions. However, medics should be familiar with basic radio operation and protocols. Knowing radio protocols helps ensure clear communication during stressful situations. Different regions have different protocols for radio operations, so the protocols you use may vary from what is described here.

Equipment Overview

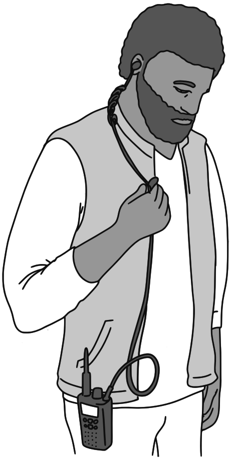
Two-way radios are radios that can both transmit and receive a signal. This is in contrast to the type of radio built into a stereo system that can only receive a signal. Use of two-way radios is typically regulated at the national level, and making transmissions using certain frequencies or using systems with a longer range (typically anything over several watts of broadcast power) requires licensing. Discussion of licensed radio operation is outside the scope of this book.

Unlicensed, personal use radios operate in on specified ranges of frequencies. In the US, Family Radio Service (FRS) is a radio system used for two-way radios offering 22 channels. In Europe, LPD433 (low power device 433 MHz) offers 16 channels.

When using a two-way radio, signals are sent and received on the same frequency, and the frequency is shared by all members of a group. Thus, only one member may talk at a time otherwise the signals interfere with one another.

Devices may offer a feature called selective calling which allows radio operators to communicate with a subset of all users within a channel. There are different protocols for selective calling, however they do not offer privacy, only a reduction in the amount of traffic an operator receives. Devices that have selective calling require the operator to select both a channel and a code. Because selective calling places many groups on a single channel, if two operators on the same channel broadcast at the same time, even if they are using different codes, their signals will interfere with one another.

Figure 35.1: Ear Piece and Microphone[12]



To start a transmission, devices will use either push-to-talk (PTT) or voice operated exchange (VOX). PTT devices require manually pushing a button before the device will switch to transmit mode. VOX devices will begin transmitting when volume crosses a threshold. VOX devices should be avoided as they may cut off the beginning of a transmission and may unintentionally transmit in loud environments.

As an additional note, if you are considering the use of radios for communication, it is recommended to use earpieces and microphone that can be clipped to a collar. This prevents the unnecessary broadcasting of tactical information to bystanders including members of law enforcement or fascists.

Radio Protocol

Following an established radio protocol makes communication clear and efficient. This is important because radio transmission degrades the understandability of human voice, and while operating as a medic, radio communications may be about ongoing emergencies. Minimizing miscommunication will help with reaching and treating patients.

The main thing to remember, if nothing else, is to communicate using ABC: accuracy, brevity, and clarity. Other guidelines are:

- Do not transmit unless necessary

- Do not respond on other's behalf unless there is a clear reason to do so
- Do not act as relay unless instructed to do so
- Do assume that all transmissions are being actively monitored by police and fascists

If radio operators are unnecessarily chatty, transmitting the message "radio discipline" is typically enough to remind other operators to keep the channel clear for important traffic.

Voice Techniques

Speaking should be modified to be more understandable during radio transmissions.

Rhythm. Speak in short sentences with pauses between sentences. Enunciate each word clearly.

Speed. Speak slightly slower than usual. This is especially important during emergencies when you may be tempted to rush a message. Saving a couple of seconds to rush a transmission will cost extra time if the receiver needs the message to be repeated.

Volume. Speak at a normal volume. Yelling does not make the signal louder for the receiver and may cause distortion.

Pitch. Operators with a deep voice should slightly increase the pitch of their voice as this is more easily understood by receivers.

Microphone Techniques

Understandability can be improved with proper microphone techniques.

Adjust gain. Devices with adjustable gain should be set so that when speaking at a normal volume, the device produces full modulation.

Speak over the microphone. When transmitting, the microphone should be held next to the mouth at a distance of roughly 5 cm so that the operator speaks over the microphone and not into it. This prevents certain sounds (like "p" or "b") from "popping" against the microphone.[i]

Wait before speaking. After depressing the PTT button, pause for roughly 1 second before speaking. This allows circuits to begin sending and receiving.

Release the button when finished. Avoid leaving the PTT button depressed when you are not speaking. If you do, the channel will be blocked for other operators.

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[i] For an example of this, hold your hand directly in front of your mouth. Say the words "pat" and "bat." Feel the burst of air against your hand.

Voice Procedure

There are procedures that help operators effectively communicate and prevent multiple operators from talking over one another. In aviation, maritime, and other more regulated settings, there are strict procedures. These work because all operators are assumed to be using the same procedure and to be both trained and experienced. For medics, less strict and less formal procedures can be used. This is because the full range of procedures is too complex and covers far more than medics will realistically encounter.

Call Signs

Radio operators should use descriptive rather than unique or numerical call signs. An example would be "Medic Team 1" or "Medic Tent North." At large actions there may be many teams of medics and non-medic personnel sharing a channel. Numeric or nickname call signs will be impossible to remember.[ii]

Call signs should be used to start a transmission beginning with the call sign of the recipient followed by the operator's own call sign. For example, one would begin a transmission with "Yellow Team, this is Blue Team." This is done to get the attention of the recipient as well as preventing multiple people from responding at the same time leading to channel interference.

Procedure Words

Procedure words (prowords) are used to convey information in a condensed, standard format. A subset of prowords can be found in Table 35.1.

Use of the proword OVER is unnecessary if the radios being used issue a tone when the PTT button is released. Use of the prowords OVER and OUT may be unnecessary when there are few operators as they can make use of the radio seem overly formal and militaristic.

When a radio check is issued, the operator is requesting that receiving operators report their signal strength and readability of their message. A radio check can be used to ensure all operators in an area are reachable as well as ensuring that equipment is functioning correctly. When responding to a radio check, there are prowords for signal strength (Table 35.2) and

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[ii] As cool as it may seem to use "Rogue One"[iii] as your call sign, that phrase will be utterly meaningless to other operators.

[iii] I'm putting a footnote within a footnote to say, *Rogue One* was the best Star Wars film. Whomst amongst us did no identify with a bunch of rag tag rebels saying "fuck authority" and running off to die in the fight against space-fascism so that others might live?

Table 35.1: Common Prowords

Proword	**Meaning**
THIS IS	The transmission is from the operator whose call sign immediately follows.
OVER	The current transmission is complete and you may now respond.
NOTHING HEARD	No response was received.
ROGER	The previous transmission was received and understood.
WILCO	Short for "ROGER, will comply."
OUT	The current exchange is complete. No response is necessary.
WAIT	I am pausing for a few seconds, and you should not transmit.
WAIT – OUT	I am pausing, and you may transmit.
SPEAK SLOWER	Your transmission was too fast to be understood, and I need you to speak slower.
SAY AGAIN	I need you to repeat you last transmission.
I SAY AGAIN	I am repeating may last transmission or the portion you requested.
READ BACK	Read my entire transmission back to me.
I READ BACK	I am reading your entire transmission back to you.
I SPELL	The next words will be spoken phonetically.
CORRECTION	I am correcting an error I made in this current transmission.
CORRECT	Yes / affirmative. Use of "affirmative" as a proword should be avoided due to confusion with "negative."
NEGATIVE	No / negative.
WRONG	Your previous transmission was wrong, and I am issuing a correction.
SWITCH TO	Switch to the following channel after confirmation.
SWITCHING TO	I am confirming a switch to the following channel.
RADIO CHECK	I am requesting a radio check.

readability (Table 35.3). The five values for signal strength correspond to the five bars used to measure cellular network or wifi strength.[iv]

Note that simple radios may not report signal strength, so reporting signal strength during a radio check may not make sense. Also note that digital radios have a signal drop off cliff where readability quickly goes from clear to unintelligible. This is in comparison to analog radios whose readability degrades gradually with distance.

Table 35.2: Signal Strength Prowords

Proword	**Meaning**
LOUD	Your signal strength is strong.
GOOD	Your signal strength is good.
WEAK	Your signal strength is weak.
VERY WEAK	Your signal stressful is very weak.
FADING	Your signal strength fades, and your reception cannot be relied upon.

Table 35.3: Readability Prowords

Proword	**Meaning**
CLEAR	The quality of your transmission is excellent.
READABLE	The quality of your transmission is satisfactory.
DISTORTED	I am having trouble reading you due to distortion.
WITH INTERFERENCE	I am having trouble reading you due to interference.
INTERMITTENT	I am having trouble reading you due to intermittent signal loss.
UNREADABLE	The quality if your transmission is so poor that you cannot be read.

When responding to a RADIO CHECK, an example response would be LOUD AND CLEAR for high quality signal and a readable transmission. For a weak signal with interference, the prowords would be WEAK WITH

[iv] Those who enjoyed the video game *StarCraft* or the movie *Aliens* will recall the prowords FIVE-BY-FIVE when describing a transmission. This corresponds to the prowords LOUD AND CLEAR.

INTERFERENCE.

NATO Phonetic Alphabet

The NATO Phonetic Alphabet (Table 35.4) is an acrophonetic mapping of alphabet letters to words to be used for clear communication and spelling over radios. For example, the word "medic" would be spelled "**M**ike-**E**cho-**D**elta-**I**ndia-**C**harlie." The NATO phonetic alphabet is a standard to make it easier for radio operators to quickly spell words and listen for spellings. The words in the list were chosen to be audibly distinct. This standard also prevents radio operators from using their own mapping of letters which can be difficult to do on the fly and may not be clear over a weak or static filled signal.

Example Conversations

Consider the following action. There are two roaming medic teams, a medic tent, and an operations team tasked with organizing equipment and live music. Respectively, their calls signs are Medic Team 1, Medic Team 2, Medic Tent, and Operations.

Example 1

Medic Team 1 has found several injured individuals. They require assistance from Medic Team 2.

Medic Team 1:	Medic Team 2, THIS IS Medic Team 1.
Medic Team 2:	Medic Team 1, THIS IS Medic Team 2.
Medic Team 1:	We have [*unintelligible*] at the end of [*unintelligible*].
Medic Team 2:	Medic Team 1. SAY AGAIN.
Medic Team 1:	We have multiple injured patients at the end of Oat Street. Requesting assistance.
Medic Team 2:	Is that Oat Street or Oak Street?
Medic Team 1:	Oat Street. I SPELL OSCAR-ALPHA-TANGO.
Medic Team 2:	ROGER. On our way. OUT.

During this exchange, for clarity, MEDIC TEAM 2 requests that MEDIC TEAM 1 repeats themself. After doing so, they additionally spell out a word to prevent confusion.

Example 2

Medic Team 1 has walked over a kilometer from the main action with a small group but wants to check that they are still reachable by all other operators.

Table 35.4: NATO Phonetic Alphabet[234]

Symbol	**Code Word**	**Pronunciation**	**Alt.**
A	Alpha	AL-fah	
B	Bravo	BRAH-voh	
C	Charlie	CHAR-lee	SHAR-lee
D	Delta	DELL-tah	
E	Echo	ECK-oh	
F	Foxtrot	FOKS-trot	
G	Golf	GOLF	
H	Hotel	HO-tell	
I	India	IN-dee-ah	
J	Juliett	JEW-lee-ETT	
K	Kilo	KEY-loh	
L	Lima	LEE-mah	
M	Mike	MIKE	
N	November	no-VEM-ber	
O	Oscar	OSS-cah	
P	Papa	pah-PAH	
Q	Quebec	KEH-beck	
R	Romeo	ROW-me-oh	
S	Sierra	see-AIR-ah	
T	Tango	TANG-go	
U	Uniform	YOU-nee-form	OO-nee-form
V	Victor	VIK-tah	
W	Whiskey	WISS-key	
X	X-ray	ECKS-ray	
Y	Yankee	YANG-kee	
Z	Zulu	ZOO-loo	
0	Zero	ZE-ro	
1	One	WUN	
2	Two	TOO	
3	Three	TREE	
4	Four	FOW-er	
5	Five	FIFE	
6	Six	SIX	
7	Seven	SEV-en	
8	Eight	AIT	
9	Nine	NIN-er	

Medic Team 1: Calling everyone. This Is Medic Team 1. Radio Check.
Operations: Medic Team 1, This Is Operations. Your signal is Loud And Clear.
Medic Tent: Medic Team 1, This Is Medic Tent. Your signal is Loud And Readable.
Medic Team 2: Medic Team 1, This Is Medic Team 2. Your signal is Weak With Interference.

Each team that receives the transmission responds with details about transmission quality. In this example, it is assumed that each team's radio has a readout for signal strength.

Example 3
Operations wants to plan logistics for cleaning up the medic tent at the end of the action, but they want to leave the main channel clear for the other medics to communicate.

Operations: Medic Tent, This Is Operations.
Medic Tent: Operations, This Is Medic Tent.
Operations: Switch To channel 4.
Medic Tent: Switching To channel 4.

When requesting a channel switch, wait for confirmation from the other operator before switching channels to prevent miscommunication and confusion.

Summary

Even without following any procedures, it is easy to effectively communicate using radios if the operators remember to be accurate, brief, and clear. Following procedures becomes more necessary during larger actions. Remember to say who you are addressing, who you are, and use short transmissions. Lastly, do not forget that the State or fascists may be snooping on your transmissions. Use caution.

Afterword

Another world is possible.

Anarchist aphorism

By reading this book, you have hopefully learned enough about riot medicine and to be able to provide care for those injured as they strive toward a world free of hierarchy and domination.

Being a medic is no simple task, but neither is being a revolutionary. Maybe you don't think of yourself as the latter, or maybe you do. Regardless, the very act deciding to care and provide for one another is a radical act. Supporting social movements and providing care to others is insurrectionary.

Revolution is not a singular point that neatly divides time into some "before" and mythic "after." We envision another world, and through a perpetual process of bettering ourselves and the society in which we exist, we hope to bring bits of this imagined other world into existence. We, the global community of anarchists, the broader coalition of the left, move forever towards a better society without ever reaching some final resting place where we are "done."

This process is tiring. It's exhausting. And your work will never be done. There will always be someone to heal.

Mutual aid is such a beautiful concept, and using this simple idea, communities can accomplish so much. What we can do is stand side by side in solidarity for our causes: a world without borders or nations, gods or masters. To these ends, I often think of this quote from José Buenaventura Durruti Dumange from 1936:[235]

> We have always lived in slums and holes in the wall. We will know how to accommodate ourselves for a time. For, you must not forget, we can also build. It is we the workers who built these palaces and cities here in Spain and in America and everywhere. We, the workers, can build others to take their place. And better ones! We are not in the least afraid of ruins. We are going to inherit the earth; there is not the slightest doubt about that. The bourgeoisie might blast and ruin its own world before it leaves the stage of history. We

> carry a new world here, in our hearts. That world is growing this minute.

But for all of this longing for another world, no optimism can overcome the reality that we very likely will not see an end to capitalism, imperialism, or fascism in our lifetimes. You cannot win every battle, and you cannot save everyone from pain or death. What you can do is minimize it. Don't focus on who you couldn't heal or save. Focus on the people you helped yesterday and those you can help tomorrow. Your care can improve their lives, even if it's a simple as cleaning pepper spray from their eyes. You may forget their face and they yours, but they will remember that on some shitty, cold day, an unnamed comrade was there to help them.

And that is what we are here to do. To help when we can, however we can, to heal and care for one another, and to show that we are all in this together.

Further Reading

I did a great deal of reading and research while writing this book to ensure that the knowledge I was passing on to others was more accurate that merely the things I'd (mis)remembered from years ago and taken to be true. I read many texts in the fields whose confluence is riot medicine, and in doing so I learned a great deal and am, I believe, a better medic for having written this book. If you liked reading this book or found it interesting and want to learn more than what I could fit in this text, you may find reading the following texts as enjoyable and useful as I did.

Principally, *Riot Medicine* is meant to mimic the style of *NOLS Wilderness Medicine* by Tom Schimelpfenig. In the past, whenever I have been asked where one can learn to be a street medic, I have pointed them toward this book. Its inclusion of additional illnesses and injuries seen while in the wilderness (snake bites, altitude sickness, etc.) may be useful for remote actions. *The Biology of Human Survival: Life and Death in Extreme Environments* by Claude A. Piantadosi goes further to discuss survival in less hospitable conditions than one typically encounters. Water protectors and other defenders of the wild may find such knowledge helpful in their struggles.

Psychological care is somewhat overlooked in many other street medic texts. To the extent that it is covered, its discussion can often feel like hand waving about anarchist theory and solidarity without explaining what stress is and how to treat it using methods based in science. For more concrete discussions, consider reading *A Clinical Guide to the Treatment of the Human Stress Response* by George S. Everly Jr. and Jeffrey M. Lating, *Mutual Aid, Trauma, & Resiliency* by the Jane Addams Collective, and *Trauma and Recovery* by Judith Herman.

The kinds of weapons used by riot police often seem to be misunderstood, or often the understanding is limited to (nevertheless useful) simplifications like "pepper spray burns, rubber bullets bruise." *'Non-Lethal' Weapons* by Neil Davison covers more on the history and modern usage of crowd control weapons and less-lethal weapons. A more anarchist perspective on this topic can be found in the zine *Warrior Crowd Control & Riot Manual* by Sprout Distro. For gunshot wounds, *Clinical Update: Gunshot Wound Ballistics* by Craig S. Bartlett is excellent.

If you want to learn more about anarchist theory and praxis, I could list texts that have useful analysis and advice or simply those that speak to me. However, lists of many texts, both old and new, exist on the internet and in anarchist bookstores, and I'm sure you can find those yourself. More than anything, I recommend long conversations with comrades, an open mind, and getting out there and just doing the damn thing.

Acronyms

ABC airway, breathing, circulation
ABCDE airway, breathing, circulation, disability, expose/examine injuries
ACAB all cops are bastards
ACL anterior cruciate ligament
ACLS advanced cardiac life support
ACS acute coronary syndrome
AED automated external defibrillator
ARWEN Anti Riot Weapon Enfield
ASD acute stress disorder
ATFL anterior talofibular ligament
AVPU alert, responsive to verbal stimuli, responsive to painful stimuli, unresponsive

BAC blood alcohol content
BG blood glucose
BLS basic life support
BP blood pressure
BPM beats per minute
BSI body substance isolation
BVM bag valve mask

CC chief complaint
CFL calcanofibular ligament
CIA Central Intelligence Agency
CNS central nervous system
CoC Code of Conduct
CPR cardiopulmonary resuscitation
CRT capillary refill time
CSF cerebrospinal fluid
CSM circulation, sensation, motion
CT computed tomography

DBP diastolic blood pressure
DKA diabetic ketoacidosis
DNR Do Not Resuscitate

DNS Domain Name System
DNSSEC Domain Name System Security Extensions
DSM-5 Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

e2e end-to-end
ECG electrocardiogram
EHF extremely high frequency
EKG electrocardiogram
EMS emergency medical services
EMT emergency medical technician
ENT ear, nose, and throat

FAST facial droop, arm weakness or drift, speech difficulty, time to call EMS
FBI Federal Bureau of Investigation
FRS Family Radio Service
FTP fuck the police

GHB gamma-Hydroxybutyric acid
GI gastrointestinal
GPG Gnu Privacy Guard
GSW gunshot wound

HARM heat, alcohol, re-injury, massage
HPA hypothalamic-pituitary-adrenal
HPMK hypothermia prevention and management kit
HR heart rate
HTTP Hypertext Transfer Protocol
HTTPS HTTP Secure

ICE Immigration and Customs Enforcement
ICP intracranial pressure
IDF Israeli Defense Force
IED improvised explosive device
IP Internet Protocol
ISP internet service provider
IV intravenous
IWW Industrial Workers of the World

KE kinetic energy

KKK Ku Klux Klan

LAN local area network
LIPC laser-induced plasma channel
LOC level of consciousness
LRAD long range acoustic device
LSD lysergic acid diethylamide

MAOI monoamine oxidase inhibitor
MARCH massive hemorrhage, airway, respiration, circulation, hypothermia
MCI mass casualty incident
MDI metered dose inhaler
MDMA 3,4-Methylenedioxymethamphetamine
MITM man-in-the-middle
mmHg millimeters of mercury
MOI mechanism of injury
MOLLE Modular Lightweight Load-carrying Equipment
MP member of parliament
MRI magnetic resonance imaging
MRSA methicillin-resistant Staphylococcus aureus
MTBI mild traumatic brain injury

NaCl sodium chloride
NATO North Atlantic Treaty Organization
NGO non-governmental organization
NIOSH National Institute for Occupational Safety and Health
NRR noise reduction rating
NSA National Security Agency
NSAID nonsteroidal anti-inflammatory drug

OC oleoresin capsicum
OHCA out-of-hospital cardiac arrest
OPQRST onset, provokes/palliates, quality, region/radiation, severity, time
ORS oral rehydration salts
OSINT open source intelligence
OTC over-the-counter

PAVA pelargonic acid vanillylamide
PC presenting complaint

PD psychological debriefing
PEP pulsed energy projectile
PF protection factor
PFA psychological first aid
PNS peripheral nervous system
PPE personal protective equipment
PRICE protect, rest, ice, compressino, elevation
PTSD post-traumatic stress disorder
PTT push-to-talk

RCA riot control agent
RFID radio-frequency identification
ROSC return of spontaneous circulation
ROSR return of spontaneous respiration
RR respiratory rate

SALT sort, assess, lifesaving interventions, triage/treatment
SAM splint structural aluminum malleable splint
SAMPLE symptoms, allergies, medication, past history, last oral intake, events leading to incident
SBP systolic blood pressure
SCI spinal cord injury
SCTM skin color, temperature, moisture
SIM subscriber identity module
SISMI Servizio per le Informazioni e la Sicurezza Militare
SNRI serotonin/norepinephrine reuptake inhibitor
SOP standard operating procedures
SPF sun protection factor
SpO$_2$ peripheral oxygen saturation
SSRI selective serotonin reuptake inhibitor
STI soft tissue injury

TBI traumatic brain injury
TBSA total body surface area
TCP Transmission Control Protocol
TLS Transport Layer Security
TPAK tension pneumothorax access kit
TrpV1 transient receptor potential cation channel subfamily V member 1
TWP Traditionalist Worker Party

UDP User Datagram Protocol

VOX voice operated exchange
VPN virtual private network

w/v weight by volume
WAN wide area network
WBGT wet-bulb globe temperature
WHO World Health Organization

Glossary

action any sort of organized or spontaneous activity that falls under the umbrella of civil disobedience, protest, civil unrest, or insurrection
advanced medical care care provided by qualified medical personnel; a facility designed for providing such care
agonal respiration an abnormal breathing pattern marked by gasping and labored breaths caused by a brainstem reflex to lack of oxygen in the brain
anisocoria a condition where the pupils are of unequal size
anterior situated above; upper
anticholinergic an agent that blocks acetylcholine at the synapses and inhibits parasympathetic activity
aphasia an inability to comprehend or formulate language
ataxia impaired voluntary motor control

blepharospasm an abnormal twitch, contraction, or closing of the eyelid
body substance isolation (abbr. BSI) precautionary measures to reduce the transmission of disease via mucous membranes and moist body substances
bradycardia heart rate under 60 beats per minute
bradypnea respiratory rate under 12 breaths per minute

casualty a person who has become injured or ill; a person who has died
cerebrospinal fluid (abbr. CSF) is a clear, colorless liquid that nourishes and protects the brain and spinal cord
clavicle a bone that acts as a strut between the scapula (shoulder blade) and sternum (breast bone); commonly known as the collarbone
collective a group of individuals who work towards a shared interest
consensus a decision made that satisfies all members of a group
contraindication a factor that makes carrying out a medical procedure inadvisable
crepitus grating, grinding, crackling, or popping sounds under the skin
cubital fossa the triangular area on the anterior view of the elbow

distal situated further from the center of the body
dorsal referring to the upper surface of an appendage
dysarthria disordered speech caused by muscle weakness

Emergency Medical Services (abbr. EMS) the branch of the healthcare system that responds to urgent and life-threatening injuries and illnesses
exudate fluid that has escaped from capillaries or tissue as a result of inflammation or injury

hernia protrusion of a organ through the structure or tissue that contains it
hyperglycemia blood glucose over 11.1 mmol/L (200 mg/dL)
hyperpnea increased respiratory rate and depth
hyperthermia a core temperature above 37.5 °C
hypoglycemia blood glucose under 3.9 mmol/L (70 mg/dL)
hypotension low blood pressure, typically with systolic pressure under 90 mmHg or diastolic pressure under 60 mmHg
hypothermia a core temperature below 35 °C
hypoxia inadequate delivery of oxygen to tissue, either global or local

inferior situated below; lower
ischemia insufficient blood flow to an organ or tissue

Korotkov sounds the sounds heard through a stethoscope when measuring blood pressure

lachrymator an irritant that causes tearing (watering of the eyes)
lateral situated in or extending toward the side

maceration the breaking down of skin due to prolonged exposure to moisture
mass casualty incident (abbr. MCI) an incident where the quantity and severity of injuries exceeds the current medical resources
mechanism of injury (abbr. MOI) the cause or circumstances in which an injury occurred; used to identify the type and severity of probably injuries
medial situated in or extending toward the middle
miosis constriction of the pupil
mydriasis great dilation of the pupil

oscillometer an instrument that measures the changes in pulsations in extremities

palmar referring to the palm of the hand
paresis weakness, loss of voluntary movement

parethsia sensations in the skin such as tingling, itching, or burning that lack an apparent physical cause
proximal situated closer from the center of the body
pseudoscience statements, beliefs, and practices that claim to scientific and based on facts but do not follow the scientific method
pulmonary aspiration inhalation of foreign material such as food, blood, or vomitus; often simply called aspiration
pulse oximeter a non-invasive device that measures peripheral oxygen saturation in the blood (SpO_2); this measurement is correlated with but not identical to arterial oxygen saturation (SO_2)

respiratory rate (abbr. RR) rate of breathing measure in breaths per minute
riot control agent (abbr. RCA) a less-lethal chemical agent (usually a lachrymator agent such as pepper spray or tear gas) used to disperse or subdue a crowd
room temperature 15 to 25 °C

scope of practice the procedures and actions that a medic may take as permitted by training, law, or both
sphygmomanometer a device used to measure blood pressure consisting of an inflatable cuff and a gauge that measures pressure; a blood pressure meter
supine lying flat on one's back

tachycardia heart rate over 100 beats per minute
tachypnea respiratory rate over 20 breaths per minute

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